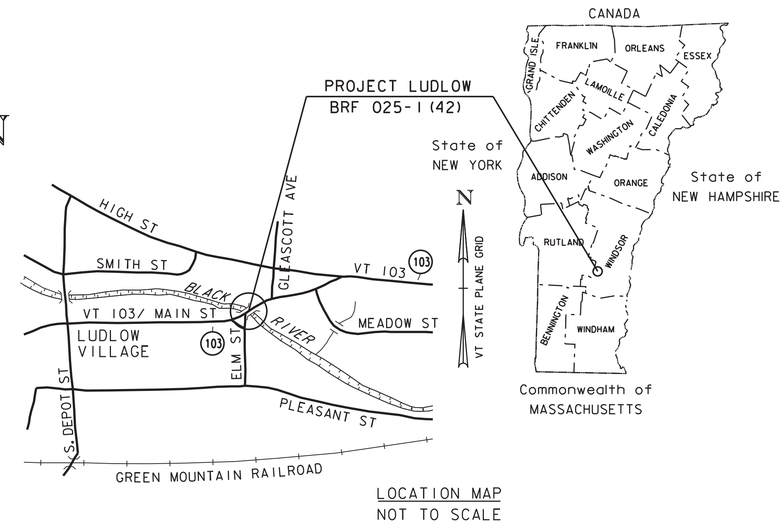
STATE OF VERMONT
AGENCY OF TRANSPORTATION



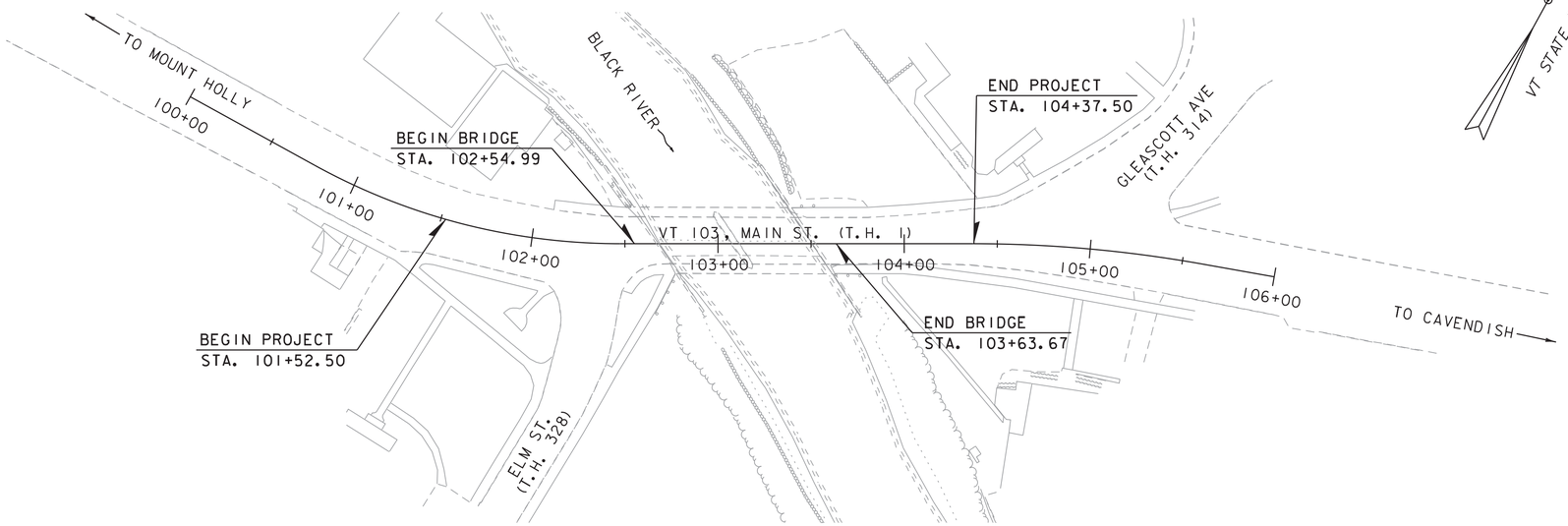
LOCATION MAP
NOT TO SCALE

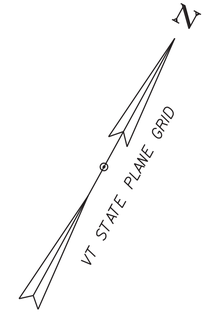
PROPOSED IMPROVEMENT
BRIDGE PROJECT
TOWN OF LUDLOW
COUNTY OF WINDSOR
ROUTE: T.H. 1 (VT 103) CLASS I (PRINCIPAL ARTERIAL) F.A.S. 025-1
BRIDGE NO. 25

PROJECT LOCATION: LOCATED IN THE COUNTY OF WINDSOR, TOWN OF LUDLOW, ON VT ROUTE 103 (MAIN ST); BRIDGE NO. 25 EXTENDS OVER THE BLACK RIVER, APPROXIMATELY 0.23 MILES EASTERLY OF THE INTERSECTION OF T.H. 330 (SOUTH DEPOT ST) AND VT ROUTE 103 (MAIN ST).

PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES THE REMOVAL AND REPLACEMENT OF BRIDGE NO. 25 ON THE EXISTING ALIGNMENT, WITH ASSOCIATED ROADWAY AND CHANNEL WORK.

LENGTH OF ROADWAY: 176.32 FEET
LENGTH OF BRIDGE: 108.68 FEET
LENGTH OF PROJECT: 285.00 FEET





CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL I
SURVEYED BY : VHB SURVEYED DATE : NOV 2010
DATUM VERTICAL NAVD 88 HORIZONTAL NAD 83 (07O)

DIRECTOR OF PROJECT DELIVERY APPROVED _____ DATE _____
PROJECT MANAGER : TODD A. SUMNER
PROJECT NAME : LUDLOW PROJECT NUMBER : BRF 025-1(42)
SHEET 1 OF 73 SHEETS

VHB 57435

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 12.01.01c

LRFD

INDEX OF SHEETS

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SD-502.00	CONCRETE DETAILS & NOTES	10-10-2012
SD-516.10	BRIDGE JOINT ASPHALT PLUG	08-29-2011
SD-601.00	STRUCTURAL STEEL DETAILS AND NOTES	06-04-2010
SD-602.00	STRUCTURAL STEEL PLATE GIRDER DETAILS AND NOTES	05-02-2011
HSD-400.01	SAFETY EDGE DETAILS	03-29-2016

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: March 2015

DRAINAGE AREA : 68.1 SQUARE MILES
CHARACTER OF TERRAIN : HILLY TO MOUNTAINOUS - MOSTLY FORESTED
STREAM CHARACTERISTICS : SINUOUS - CHANNELIZED THROUGH THE VILLAGE
NATURE OF STREAMBED : COBBLE GRAVEL

PEAK FLOW DATA

Q 2.33 =	3200 CFS	Q 50 =	9826 CFS
Q 10 =	5460 CFS	Q 100 =	12352 CFS
Q 25 =	7800 CFS	Q 500 =	19900 CFS

DATE OF FLOOD OF RECORD 1927
ESTIMATED DISCHARGE: 24000 CFS
WATER SURFACE ELEV.: UNKNOWN
NATURAL STREAM VELOCITY : @ Q100 = 11.8 FPS
ICE CONDITIONS : MODERATE
DEBRIS: MODERATE
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? NO
IS ORDINARY RISE RAPID? NO
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? UNKNOWN
IF YES, DESCRIBE:

WATERSHED STORAGE: < 1 % HEADWATERS: X
UNIFORM:
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: 2 SPAN CIP T-BEAM ON CIP CONCRETE SUBSTRUCTURES
YEAR BUILT: 1928
CLEAR SPAN(NORMAL TO STREAM): 2 SPAN, 32.0 FT PER SPAN (67.0 FT TOTAL)
VERTICAL CLEARANCE ABOVE STREAMBED: 13.0 FT
WATERWAY OF FULL OPENING: 737 SQ. FT.
DISPOSITION OF STRUCTURE: REMOVAL AND REPLACEMENT
TYPE OF MATERIAL UNDER SUBSTRUCTURE: TIMBER PILES

WATER SURFACE ELEVATIONS AT:

Q2.33 =	988.4 FT	VELOCITY =	7.8 FPS
Q10 =	991.1 FT	"	9.5 FPS
Q25 =	994.7 FT	"	10.3 FPS
Q50 =	995.4 FT	"	10.0 FPS
Q100 =	996.8 FT	"	10.2 FPS

LONG TERM STREAMBED CHANGES: STABLE

IS THE ROADWAY OVERTOPPED BELOW Q100: YES
FREQUENCY: Q25
RELIEF ELEVATION: 993.1 FT
DISCHARGE OVER ROAD @Q100: 4952 CFS

UPSTREAM STRUCTURE

TOWN: LUDLOW DISTANCE: 1170 FT
HIGHWAY # : TH 308 (N. DEPOT ST) STRUCTURE #: B56
CLEAR SPAN: 28.7 FT CLEAR HEIGHT:
YEAR BUILT: 1954 FULL WATERWAY:
STRUCTURE TYPE: STEEL STRINGER

DOWNSTRUCTURE STRUCTURE

TOWN: LUDLOW DISTANCE: 1380 FT
HIGHWAY # : TH 324 (MILL ST) STRUCTURE #: B57
CLEAR SPAN: 25 FT CLEAR HEIGHT:
YEAR BUILT: 1929 FULL WATERWAY:
STRUCTURE TYPE: STEEL TRUSS

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
TONNAGE	**20**	**36**	**36**	**66**	**30**	**34.5**	**38**
INVENTORY	3.77	1.64					
POSTING							
OPERATING	4.89	2.13	3.07	1.9	3.05	2.7	2.76
COMMENTS:							

* - SEE PROJECT NOTES FOR VALUES.

PILE DRIVING AND TESTING REQUIREMENTS

1. NOMINAL PILE DRIVING CAPACITY	Rndr:	*
2. PILE TEST RESISTANCE FACTOR	ϕ:	0.65
3. MAXIMUM PILE TIP ELEVATION		*

4. A MINIMUM OF 1 DYNAMIC TEST PER ABUTMENT SHALL BE PERFORMED DURING INSTALLATION. THE REMAINING SHOULD BE CALIBRATED BY WAVE EQUATION ANALYSIS. PILES MUST BE DRIVEN A MINIMUM OF 25' BELOW BOTTOM OF ABUTMENT REGARDLESS IF REQUIRED DRIVING RESISTANCE HAS BEEN MET.

PROPOSED STRUCTURE

STRUCTURE TYPE: SINGLE SPAN PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE ON INTEGRAL ABUTMENTS
CLEAR SPAN(NORMAL TO STREAM): 83.0 FT
VERTICAL CLEARANCE ABOVE STREAMBED: 12.7 FT
WATERWAY OF FULL OPENING: 815 SQ. FT.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	988.3 FT	VELOCITY=	7.2 FPS
Q10 =	991.0 FT	"	8.4 FPS
Q25 =	994.4 FT	"	9.4 FPS
Q50 =	995.1 FT	"	9.6 FPS
Q100 =	996.6 FT	"	9.9 FPS

IS THE ROADWAY OVERTOPPED BELOW Q100: YES
FREQUENCY: Q25
RELIEF ELEVATION: 993.1 FT
DISCHARGE OVER ROAD @Q100: 4441 CFS

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 992.0
VERTICAL CLEARANCE: @ Q50 = -3.1 FT

SCOUR: CONTRACTION SCOUR @ Q100 = 2.2-FT
CONTRACTION SCOUR @ Q200 = 2.4-FT
REQUIRED CHANNEL PROTECTION: STONE FILL, TYPE III *

PERMIT INFORMATION

AVERAGE DAILY FLOW:	- - -	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	- - -	- - -
ORDINARY HIGH WATER:	- - -	- - -

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: NO TEMPORARY BRIDGE PROPOSED
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A

ADDITIONAL INFORMATION

* - HYDRAULICS REPORT RECOMMENDS TYPE IV, BUT DUE TO SITE CONSTRAINTS USE STONE FILL TYPE III

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1.	DESIGN LIVE LOAD		HL-93
2.	FUTURE PAVEMENT	d_p:	3.0 INCH
3.	DESIGN SPAN	L:	105.50 FT
4.	MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	- - -
5.	PRESTRESSING STRAND	f_y:	- - -
6.	PRESTRESSED CONCRETE STRENGTH	f'_c:	- - -
7.	PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	- - -
8.	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)	f'_c:	5.0 KSI
9.	CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	4.0 KSI
10.	CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	- - -
11.	CONCRETE, CLASS C	f'_c:	- - -
12.	REINFORCING STEEL	f_y:	60 KSI
13.	STRUCTURAL STEEL AASHTO M270	f_y:	50 KSI
14.	SOIL UNIT WEIGHT	γ:	0.140 KCF
15.	NOMINAL BEARING RESISTANCE OF SOIL	q_n:	- - -
16.	SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	- - -
17.	NOMINAL BEARING RESISTANCE OF ROCK	q_n:	- - -
18.	ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	- - -
19.	NOMINAL AXIAL PILE RESISTANCE	q_p:	328.0 KIPS
20.	PILE YIELD STRENGTH ASTM A572	f_y:	50 KSI
21.	PILE SIZE		HP 14X89
22.	EST. PILE LENGTH	L_p:	54.0 FT
23.	PILE RESISTANCE FACTOR	ϕ:	1.00
24.	LATERAL PILE DEFLECTION	Δ:	--- INCH
25.	BASIC WIND SPEED	V_{3s}:	- - -
26.	MINIMUM GROUND SNOW LOAD	p_g:	- - -
27.	SEISMIC DATA PGA: - - -	S_s:	- - -
		S_1:	- - -

TRAFFIC DATA

	ADT	DHV	% D	% T	ADTT
CY	9500	1300	55	5.3	630
20	10400	1400	55	7.4	960

20 year ESAL for flexible pavement from 2012 to 2032 : 5.686.000
40 year ESAL for flexible pavement from 2012 to 2052 : 13.347.000
Design Speed : 30 mph

AS BUILT "REBAR" DETAILS

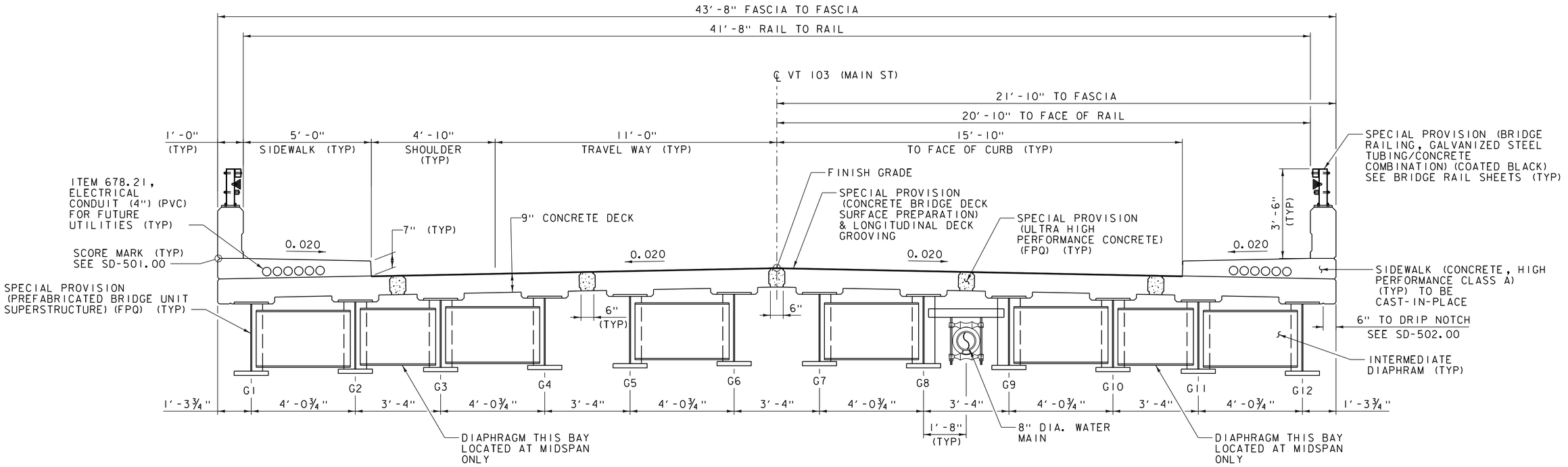
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: 10j068pi.xls
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: VHB
PRELIMINARY INFORMATION SHEET

PLOT DATE: 8/22/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 2 OF 73

VHB 57435



TYPICAL PREFABRICATED BRIDGE UNIT SECTION

SCALE ½" = 1'-0"

NOTES:

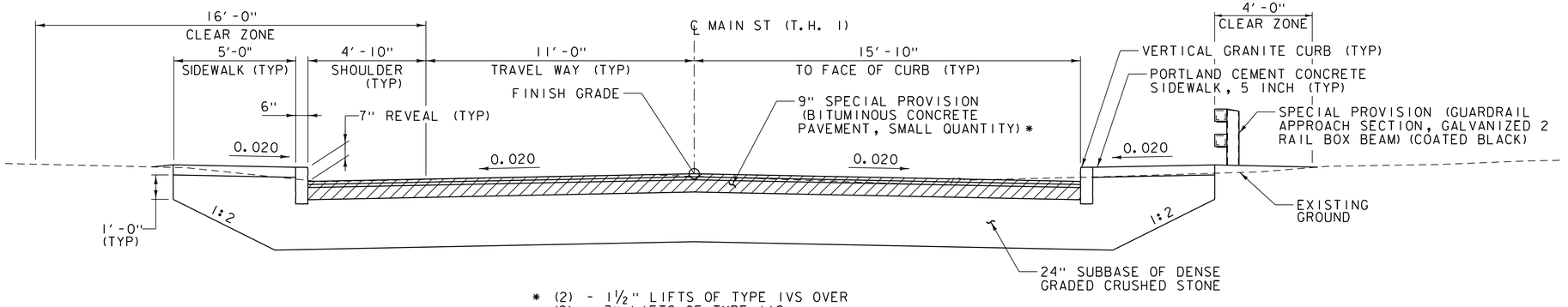
1. STRUCTURAL STEEL SHALL BE METALLIZED IN ACCORDANCE WITH ITEM 900.645 "SPECIAL PROVISION (METALLIZING STRUCTURAL STEEL)".
2. THE ENTIRE BRIDGE DECK SURFACE BETWEEN THE CURBS SHALL BE DIAMOND GROUND. PAYMENT WILL BE PAID FOR UNDER ITEM 900.670, "SPECIAL PROVISION (SUFRACE PREPARATION)".
3. DECK SHALL BE GROOVED AND PAYMENT WILL BE PAID FOR UNDER ITEM 509.10, "LONGITUDINAL DECK GROOVING".
4. SUPPORTS FOR UTILITY WILL BE CONSIDERED INCIDENTAL TO ITEM 900.645, "SPECIAL PROVISION (WATER MAIN ON THE BRIDGE) (8")".

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068typ.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
TYPICAL BRIDGE SECTION

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 3 OF 73

VHB 57435



* (2) - 1½" LIFTS OF TYPE IVS OVER
(2) - 3" LIFTS OF TYPE IIS

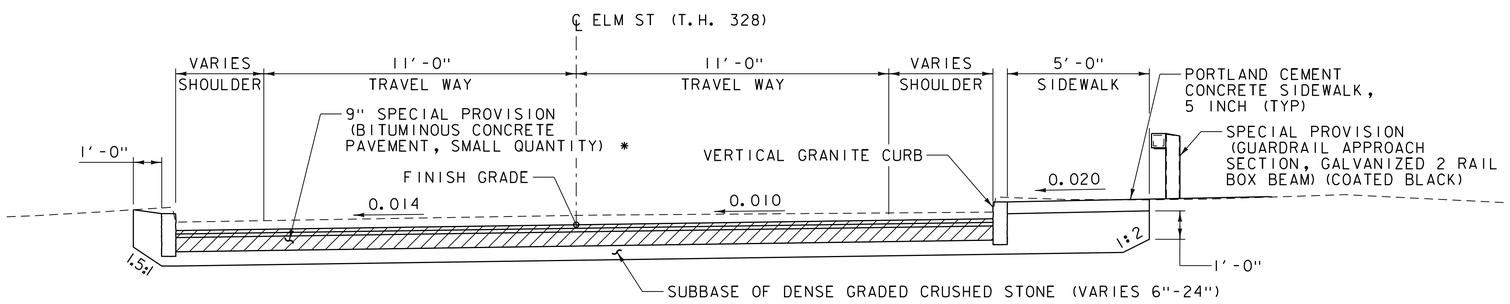
TYPICAL VT 103 ROADWAY SECTION

SCALE ⅜" = 1'-0"

MATERIAL TOLERANCES

(IF USED ON PROJECT)

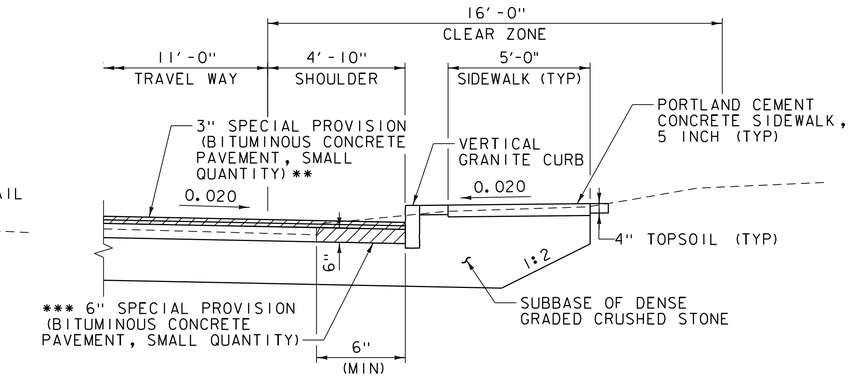
SURFACE	
PAVEMENT (TOTAL THICKNESS)	+/- ¼"
SUBBASE OF DENSE GRADED CRUSHED STONE	+/- 1"



* (2) - 1½" LIFTS OF TYPE IVS OVER
(2) - 3" LIFTS OF TYPE IIS

TYPICAL ELM ST ROADWAY SECTION

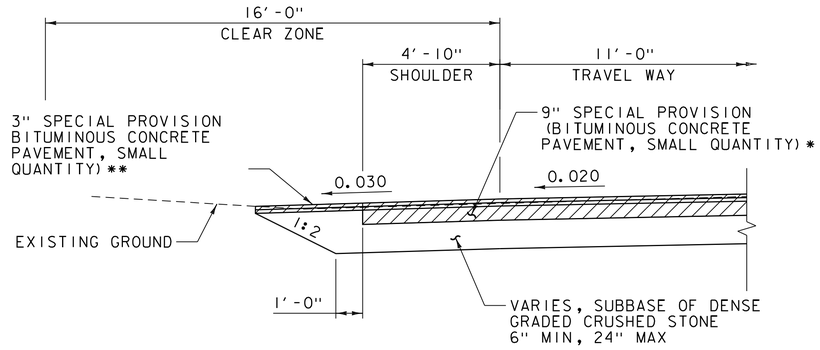
SCALE ⅜" = 1'-0"



** (2) - 1½" LIFTS OF TYPE IVS
*** (2) - 3" LIFTS OF TYPE IIS

TYPICAL ROADWAY SECTION

WITH GRASS STRIP BETWEEN ROAD AND SIDEWALK
STA. 104+29 - 104+74, RT
SCALE ⅜" = 1'-0"

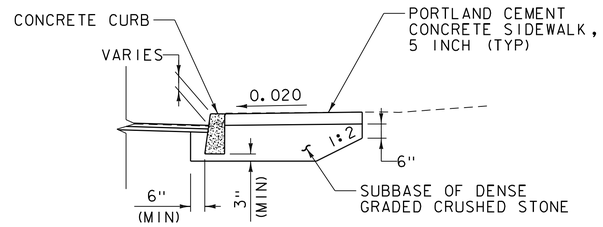


* (2) - 1½" LIFTS OF TYPE IVS OVER
(2) - 3" LIFTS OF TYPE IIS

** (2) - 1½" LIFTS OF TYPE IVS

TYPICAL ROADWAY SECTION AT PAVED DRIVE

NO CURB OR SIDEWALK
SCALE ⅜" = 1'-0"

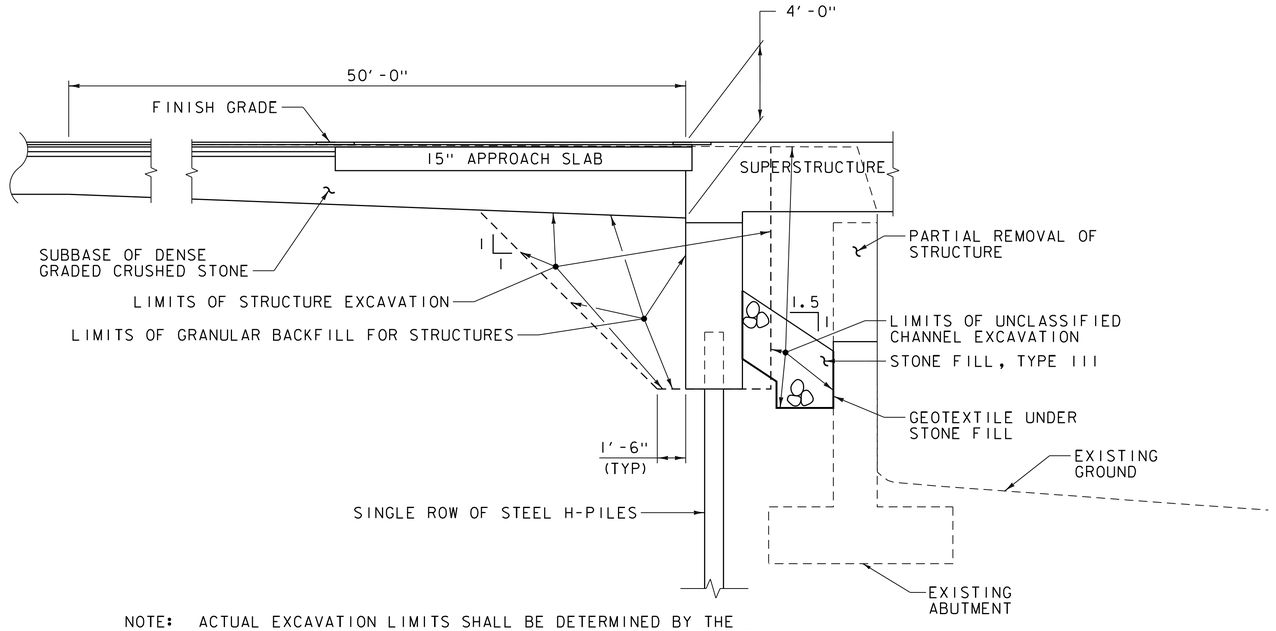


TYPICAL ROADWAY SECTION AT CURB REPLACEMENT

SIDEWALK AND CURB REPLACEMENT
STA. 100+94 - 101+17, RT
SCALE ⅜" = 1'-0"

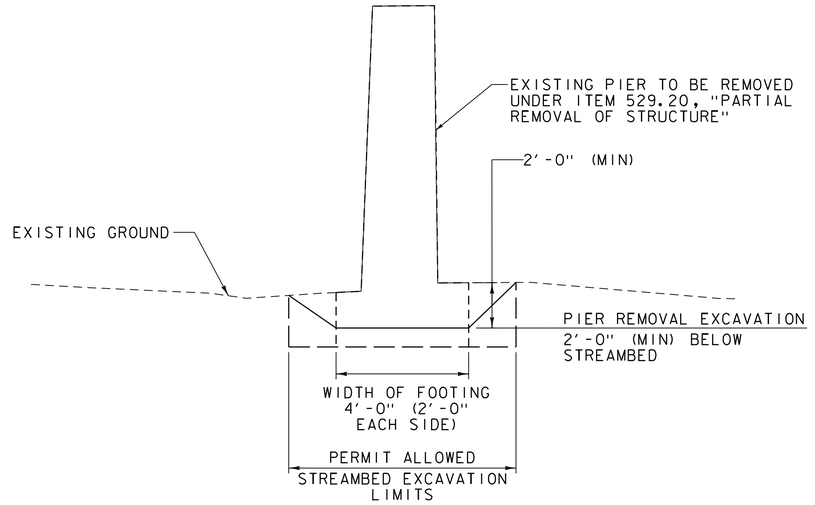
vhb

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068typ.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: A.P. GUYETTE	CHECKED BY: A.P. GUYETTE
TYPICAL ROADWAY SECTIONS	SHEET 4 OF 73



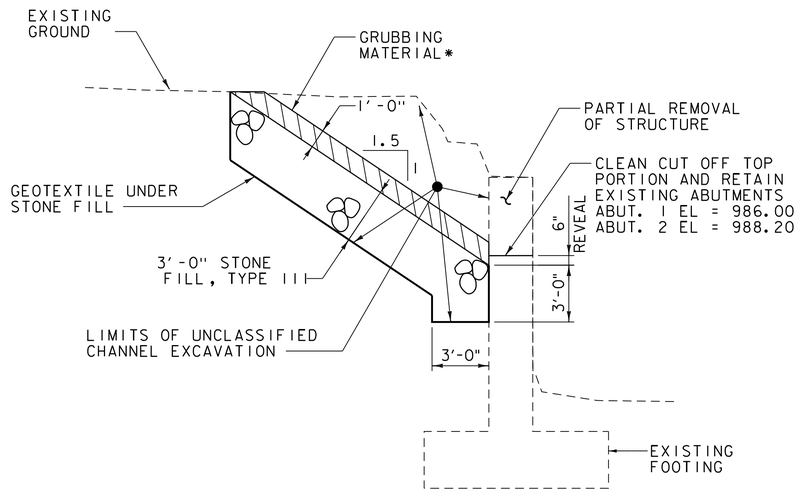
NOTE: ACTUAL EXCAVATION LIMITS SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER, ONLY THE EXCAVATION BETWEEN THE LIMITS SHOWN WILL BE PAID FOR UNDER ITEM 204.25, "STRUCTURE EXCAVATION". EXCAVATION OUTSIDE OF THESE LIMITS WILL BE AT THE EXPENSE OF THE CONTRACTOR.

ABUTMENT EARTHWORK SECTION
NOT TO SCALE



PIER REMOVAL SECTION
NOT TO SCALE

1. THE CONTRACTOR SHALL REVIEW THE APPROPRIATE ENVIRONMENTAL PERMITS FOR ALLOWABLE STREAMBED DISTURBANCE LIMITS.
2. ANY REQUIRED SUPPORT OF EXCAVATION, CONTROL OF WATER, OR COFFERDAM WILL NOT BE PAID FOR SEPARATELY, BUT WILL BE INCLUDED IN ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE".
3. EXCAVATED PIER MATERIAL TO BE FILLED IN WITH ITEM 900.608, "SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL) (TYPE III)".



TYPICAL CHANNEL SECTION
NOT TO SCALE

* GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.

NOTE: IN AREAS WHERE THERE IS NO EXISTING ABUTMENT, STONE FILL SHALL BE KEYED IN FRONT OF EXISTING STONE WALL OR INTO CHANNEL BANK.

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068typ.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: A.P. GUYETTE	CHECKED BY: A.P. GUYETTE
TYPICAL EARTHWORK SECTIONS	SHEET 5 OF 73

PROJECT NOTES

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2011, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION, AND THEIR LATEST REVISIONS.

2. ALL PRECAST CONCRETE ELEMENTS SHALL BE FABRICATED TO THE SPECIFIED DIMENSIONS WITHIN THE TOLERANCES DICTATED IN THE PRECAST/PRESTRESSED CONCRETE INSTITUTE TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION, MNL 135-00, AND ITS LATEST REVISIONS OR AS DIRECTED IN THE CONTRACT DOCUMENTS.

3. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

4. THE BRIDGE IS DESIGNED FOR HL-93 LIVE LOAD WITH A 3.0 INCH ALLOWANCE FOR FUTURE PAVEMENT.

5. ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE", SHALL BE USED FOR THE REMOVAL AND DISPOSAL OF THE EXISTING BRIDGE SUPERSTRUCTURE, AND FOR ANY PORTION OF THE EXISTING ABUTMENTS THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION, INCLUDING THE REMOVAL OF THE PIER. ABUTMENTS ARE TO BE REMOVED TO THE ELEVATIONS SHOWN IN THE PLANS WITH A CLEAN CUT OR AS DIRECTED BY THE ENGINEER. PIER SHALL BE REMOVED TO A MINIMUM OF 2'-0" BELOW THE STREAMBED OR AS DIRECTED BY THE ENGINEER.

6. NO SUBSTITUTION FOR PRECAST CONCRETE WILL BE PERMITTED.

7. CONTRACTOR SHALL EXERCISE EXTREME CARE WHEN EXCAVATING NEAR AND BACKFILLING IN THE VICINITY OF EXISTING UTILITIES, AND SHALL USE HAND EXCAVATION WHERE APPROPRIATE. CONTRACTOR SHALL REPAIR ANY DAMAGE INCURRED DURING CONSTRUCTION TO EXISTING UTILITIES SCHEDULED TO REMAIN, AT NO COST TO THE OWNER. ALL EXISTING PIPING AND STRUCTURES EXPOSED DURING CONSTRUCTION SHALL BE ADEQUATELY SUPPORTED, BRACED OR OTHERWISE PROTECTED DURING CONSTRUCTION ACTIVITIES. UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER, THE CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES IN SERVICE AT ALL TIMES. ALL UNDERGROUND UTILITIES SHALL BE RETAINED UNLESS OTHERWISE NOTED OR DIRECTED BY THE ENGINEER. CONTRACTOR SHALL CALL DIG SAFE AND VERIFY LOCATION OF UTILITIES AS SHOWN ON THE PLANS.

8. DUE TO STABILITY CONCERNS AT THE ABUTMENTS DURING THE ERECTION OF THE SUPERSTRUCTURE, THE CONTRACTOR SHALL SUBMIT THE ERECTION PLAN A MINIMUM OF 30 WORKING DAYS PRIOR TO ERECTING THE SUPERSTRUCTURE. UNDER NO CIRCUMSTANCES SHALL A BRIDGE CLOSURE PERIOD BEGIN PRIOR TO HAVING AN ACCEPTED ERECTION PLAN.

9. THE BACKFILL BEHIND THE ABUTMENTS SHALL BE LIMITED TO A HEIGHT OF 3'-0" BELOW THE BRIDGE SEAT AND NO CRANES OR CRANE SUPPORTS SHALL BE CLOSER THAN 5'-0" TO THE ABUTMENT DURING THE ERECTION OF THE SUPERSTRUCTURE.

10. FOLLOWING CONSTRUCTION THE HIGHWAY EASEMENT ON PARCEL #4 WILL BE USED BY THE TOWN OF LUDLOW ONLY FOR THE MAINTENANCE AND THE REPLACEMENT OF PROJECT INSTALLATIONS. THE OWNERS OF PARCEL #4 MAY PERFORM LANDSCAPING IN THE HIGHWAY EASEMENT AREA FOLLOWING CONSTRUCTION.

TRAFFIC CONTROL

11. THE CONTRACTOR SHALL IMPLEMENT THE ROAD CLOSURE, TRAFFIC CONTROL, AND DETOUR AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR ANY STAGES OF CONSTRUCTION NOT SHOWN IN THE PLANS. THE PLAN SHALL CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. THE PLAN SHALL SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE WAY TRAFFIC, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. THE CONTRACTOR SHALL SUBMIT DETAILED TRAFFIC CONTROL PLANS TO THE ENGINEER FOR APPROVAL PER SUBSECTION 105.03. ALL COSTS WILL BE INCLUDED IN ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

12. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) WILL BE PAID FOR UNDER ITEM 641.15, "PORTABLE CHANGEABLE MESSAGE SIGN".

13. FULL ACCESS TO ALL DRIVES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED AT ALL TIMES. THIS WORK WILL BE CONSIDERED INCIDENTAL TO ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

14. UNLESS COVERED UNDER INDIVIDUAL PAY ITEMS OR NOTED OTHERWISE, ALL COSTS FOR WORK SHOWN ON THE TRAFFIC CONTROL SHEETS AND FOR TEMPORARY TRAFFIC CONTROL DEVICES WILL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". THIS INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING ITEMS:

    RETROREFLECTIVE DRUMS
    SIGNS
    SIGN POSTS
    INSTALLATION OF SIGNS AND SIGN POSTS
    TEMPORARY TRAFFIC BARRIER

    TEMPORARY TRAFFIC BARRIER SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 621. UNIFORM TRAFFIC OFFICERS AND FLAGGERS WILL BE PAID FOR SEPARATELY UNDER THE APPROPRIATE ITEM NUMBER.

15. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).

16. INSTALLATION OF TEMPORARY TRAFFIC CONTROL SIGNS SHALL NOT BLOCK ANY EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES. THE CONTRACTOR SHALL TRY TO MAINTAIN AT LEAST 200 FEET BETWEEN SIGN ASSEMBLIES.

EARTHWORK

17. THE "STONE FILL, TYPE III" UNDER THE BRIDGE AS SHOWN IN THE PLANS SHALL BE PLACED BEFORE THE PREFABRICATED BRIDGE UNITS ARE SET.

18. TEMPORARY CONSTRUCTION FILLS WITHIN THE WATERCOURSE FOR ANY PURPOSE SHALL CONSIST OF CLEAN STONE FILL ONLY. SEE THE SPECIAL PROVISIONS FOR PERMIT INFORMATION. NO OTHER FILLING IN THE STREAM SHALL OCCUR WITHOUT THE APPROVAL OF THE STREAM ALTERATION ENGINEER.

CONCRETE AND REINFORCING STEEL

19. ITEM 514.10, "WATER REPELLENT, SILANE", SHALL BE APPLIED TO ALL EXPOSED CONCRETE ON THE BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE, WITH THE EXCEPTION OF THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES. THE SUBSTRUCTURE SHALL RECEIVE A MINIMUM OF ONE COAT AND THE SUPERSTRUCTURE SHALL RECEIVE A MINIMUM OF TWO COATS OF WATER REPELLENT, SILANE.

20. ALL FORM SUPPORTS AND FORM TIES THAT ARE TO REMAIN PERMANENTLY IN THE CONCRETE ABOVE THE BRIDGE SEAT SHALL BE GALVANIZED AND CONFORM TO SECTION 726 OF THE STANDARD SPECIFICATIONS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO SUPERSTRUCTURE ITEMS.

21. ALL RECESSED LIFTING POINTS SHALL BE FILLED WITH A TYPE IV MORTAR PER SUBSECTION 707.03 AND WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE PRECAST ITEM.

22. THE METHOD OF FORMING FOR SUBSEQUENT POURS AFTER PLACING THE PRECAST SUPERSTRUCTURE UNITS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR IS ENCOURAGED TO WORK WITH THE FABRICATOR IF ADDITIONAL SUPPORTS MAY BE REQUIRED. IN NO CASE SHALL THE CONTRACTOR ATTACH ADDITIONAL FORM OR SCREED SUPPORTS BY DRILLING, USING HAMMER AND NAILS, OR SIMILAR MEANS INTO ANY PREFABRICATED SUPERSTRUCTURE UNIT.

23. NO LOADING SHALL BE APPLIED TO THE SUPERSTRUCTURE UNTIL THE LONGITUDINAL CLOSURE POUR HAS REACHED A MINIMUM OF 14,000 PSI.

24. SIDEWALK CONCRETE WILL BE PAID FOR UNDER 501.33, "CONCRETE, HIGH PERFORMANCE CLASS A". UTILITY DUCTS AS SHOWN IN THE PLANS WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE CONCRETE ITEM AND SHALL BE IN ACCORDANCE WITH SECTION 752.08.

25. BRIDGE RAIL SHALL BE HIGH PERFORMANCE CLASS A CONCRETE AND WILL BE PAID UNDER ITEM 900.640, "SPECIAL PROVISION (BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION)(COATED BLACK)". THE EFFECTIVE CURE TIME OF THE BRIDGE RAIL MAY BE REDUCED TO A MINIMUM OF (7) SEVEN DAYS PROVIDED THAT THE CONCRETE HAS REACHED 85% OF THE DESIGN COMPRESSIVE STRENGTH (f'c). THE BRIDGE RAIL SHALL MEET ALL OTHER SPECIFICATIONS OF SECTION 501 OF THE STANDARD SPECIFICATIONS.

26. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

ALONG BACK FACES OF WALLS AGAINST EARTH:	2 INCH
ALONG TOP SURFACE OF DECK SLAB:	3 INCH*
ALONG BOTTOM SURFACE OF DECK SLAB:	1½ INCH
ELSEWHERE UNLESS OTHERWISE NOTED:	3 INCH

* THERE SHALL BE 3" COVER ON THE TOP SURFACE OF THE DECK SLAB INITIALLY. AFTER FINAL GRINDING, A MINIMUM COVER OF 2½" COVER SHALL BE MAINTAINED ACROSS THE DECK.

PRECAST ABUTMENTS AND POST-TENSIONING

27. IF A VERTICAL CONSTRUCTION JOINT(S) IS REQUIRED BY THE CONTRACTOR FOR SHIPMENT OF THE ABUTMENTS SHALL BE KEYED AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS. EACH JOINT SHALL NOT BE LOCATED CLOSER THAN 1'-0" AWAY FROM THE EDGE OF THE PILE CAVITY. NO LESS THAN TWO PILES SHALL SUPPORT EACH PRECAST ABUTMENT SECTION.

28. EPOXY BONDING COMPOUND SHALL BE APPLIED TO ALL VERTICAL MATCH CAST CONSTRUCTION JOINTS. SEE AGENCY WEBSITE FOR LIST OF APPROVED EPOXY BONDING COMPOUNDS. PAYMENT FOR EPOXY WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

29. POST-TENSIONING AND ASSOCIATED ITEMS ARE ONLY REQUIRED IF THE PILE CAP IS CONSTRUCTED OF MORE THAN ONE UNIT. ANY POST-TENSIONING STRANDS AND CONDUIT SHALL ADHERE TO THE REQUIREMENTS OF SECTION 510 – PRESTRESSED CONCRETE. GALVANIZED ANCHOR ASSEMBLIES, CONDUIT AND POST-TENSIONING STRANDS WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM. POST-TENSIONING STRANDS SHALL BE COVERED WITH SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND, EXCEPT AT ANCHORAGE LOCATIONS. ABUTMENTS SHALL BE POST-TENSIONED PRIOR TO FILLING THE VOIDS.

30. POST-TENSIONING SHALL BE COMPLETED PRIOR TO POURING THE PILE CAVITY CLOSURE POUR.

31. GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M232M/M 232.

32. ITEM 524.21, JOINT SEALER, POLYURETHANE, SHALL BE APPLIED TO THE OUTSIDE FAR FACE OF ALL VERTICAL MATCH CAST CONSTRUCTION JOINTS.

33. ANCHOR BOLTS, LEVELING PLATE, NUTS AND WASHERS EXPANDABLE JOINT FILLER, AND ELASTOMERIC PADS WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

34. DESIGN VALUES
    A. CONCRETE COMPRESSIVE STRENGTH: f'c = 5,000 PSI.
    B. POST-TENSIONING STRANDS: 0.5 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.
    C. ASSUMED MODULUS OF ELASTICITY IS 28,500 KSI.
    D. THERE SHALL BE 2 STRANDS PER CONDUIT.
    E. JACKING FORCE PER STRAND = 32 KIPS.

35. WINGWALLS SHALL NOT BE BACKFILLED UNTIL THE GROUT FOR THE MECHANICAL SPLICE CONNECTORS HAS BEACHED 85% OF THE MANUFACTURER SPECIFIED DESIGN STRENGTH.

36. THE CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF SUBSECTION 711.01 AND SHALL BE GALVANIZED PER SUBSECTION 726.08 OF THE STANDARD SPECIFICATIONS. ALL COSTS ASSOCIATED WITH FURNISHING AND PLACING THE CORRUGATED STEEL PIPE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

37. ALL ABUTMENT REINFORCING TO BE EPOXY COATED.

PREFABRICATED BRIDGE UNITS

38. STRUCTURAL STEEL MEMBERS DESIGNATED "CVN" IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01.

39. ANY HOLES IN THE WEBS OF THE FASCIA BEAMS NOT OTHERWISE FILLED SHALL BE FILLED WITH BUTTON HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.19.

40. PREFABRICATED BRIDGE UNITS SHALL BE FABRICATED TO THE DIMENSIONS SHOWN ON THE PLANS. PRECAST BACKWALL DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

41. UNLESS OTHERWISE NOTED, ALL NEW STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270/M270M GRADE 50 AND WILL BE PAID FOR UNDER ITEM 900.675, "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (FPQ)".

42. THE CONTRACTOR SHALL DEVELOP DETAILED STEP BY STEP PROCEDURES FOR FABRICATING THE PBUs. THE PROCEDURES SHALL BE SUBMITTED WITH THE REQUIRED FABRICATION DETAILS.

43. THE CONTRACTOR SHALL ASSEMBLE THE ENTIRE BRIDGE SUPERSTRUCTURE STEEL AS A SINGLE UNIT PRIOR TO PRECASTING THE CONCRETE DECK PORTION OF THE PBUs.

44. THE STRUCTURAL STEEL SHALL BE SETUP ON TEMPORARY SUPPORTS WITH AN ASSUMED DATUM THAT SIMULATES THE ACTUAL FINAL ELEVATIONS.

45. THE CLOSURE JOINTS BETWEEN PBUS SHALL BE BLOCKED OUT DURING THE PRECASTING OPERATION.

46. STRUCTURAL STEEL SHALL BE METALIZED IN ACCORDANCE WITH SECTION 726.09. METALLIZING WILL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (METALLIZING STRUCTURAL STEEL)". ALL WELDING TO THE STRUCTURAL STEEL SHALL BE COMPLETED PRIOR TO METALLIZING.

47. AFTER SUPERSTRUCTURE STEEL ELEMENTS HAVE BEEN SET UP, AND BEFORE ANY FORMWORK OR OTHER LOADS ARE ADDED TO THE GIRDERS, ELEVATIONS ALONG THE TOP OF THE GIRDERS SHALL BE TAKEN FOR USE IN DETERMINING DECK FORMWORK ELEVATIONS.

48. DURING FABRICATION OF THE PBUs THE CONTRACTOR SHALL LOAD THE UNITS EVENLY TO MINIMIZE DIFFERENTIAL CAMBER BETWEEN UNITS.

49. ENDS OF GIRDERS ARE TO BE VERTICAL IN FINAL POSITION.

50. BEAM WEBS AND DIAPHRAGMS SHALL BE PLUMB IN FINAL POSITION.

51. ANY CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL.

52. ADDITIONAL HEIGHT STUDS MAY BE REQUIRED SO THE HEADS OF ALL STUDS ARE LOCATED BETWEEN THE MATS OF REINFORCING.

53. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER HIGH STRENGTH BOLTS IN 15/16" DIAMETER HOLES, PER SECTION 506 UNLESS OTHERWISE NOTED.

54. ALL CONCRETE PLACED IN THE DECK OF THE PREFABRICATED BRIDGE UNITS SHALL MEET THE REQUIREMENTS OF ITEM 900.675, "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)(FPQ)".

55. PBU STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF SECTION 506 OF THE STANDARD SPECIFICATIONS.

56. PBU DECKS SHALL MEET THE REQUIREMENTS OF "CONCRETE, HIGH PERFORMANCE CLASS A".

57. METHOD OF FORMING FLANGE CONNECTION SHALL BE DETERMINED BY THE CONTRACTOR. THE FORMS SHALL BE REMOVABLE AND ABLE TO ACCOMMODATE DIFFERENTIAL CAMBER. FORM SUPPORTS SHALL NOT BE ATTACHED TO ANY PREFABRICATED SUPERSTRUCTURE ELEMENT BY DRILLING OR SIMILAR MEANS.

58. PAYMENT FOR THE DIAPHRAGMS WILL BE INCLUDED IN THE ITEM 900.640, "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (FPQ)."

59. UTILITY SUPPORTS ON THE BRIDGE WILL BE CONSIDERED INCIDENTAL TO ITEM 900.645, "SPECIAL PROVISION (WATER MAIN ON THE BRIDGE)(8")".

60. ANY CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL.

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068pn.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
PROJECT NOTES (1 OF 2)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 6 OF 73

UHPC / LONGITUDINAL CLOSURE POUR

61. NO UHPC SUBSTITUTION WILL BE ACCEPTED.

62. THE CONCRETE EDGES ALONG THE LONGITUDINAL CLOSURE POURS AS WELL AS AREAS THAT WILL BE IN CONTACT WITH UHPC AT THE DECK ENDS SHALL BE TREATED TO PROVIDE A ROUGHENED/EXPOSED AGGREGATE SURFACE. THAT AMPLITUDE OF THE EXPOSED AGGREGATE SHALL BE A MINIMUM OF 1/8" AND BE COMPLETED PRIOR TO ERECTION OF THE BEAMS. THE FABRICATOR SHALL INDICATE THE METHOD USED TO ACHIEVE THIS PROFILE ON THE FABRICATION DRAWINGS AND METHOD USED TO PROTECT THE REINFORCING STEEL.

63. UHPC JOINTS SHALL BE CONSTRUCTED WITH FORMWORK THAT IS WATERTIGHT. TOP FORMS ARE REQUIRED TO KEEP UHPC FROM OVERFLOWING OUTSIDE OF THE JOINTS.

64. PRIOR TO PLACEMENT OF UHPC, THE CONCRETE JOINTS SHALL BE SATURATED FOR 24 HOURS TO ENSURE A GOOD BOND.

65. UHPC JOINTS SHALL BE OVERFILLED ¼" TO ALLOW FOR GRINDING THE DECK SURFACE ONCE THE UHPC HAS REACHED 14,000 PSI.

PRECAST APPROACH SLABS

66. PRECAST CONCRETE COMPRESSIVE STRENGTH: f'c = 5,000 PSI.

67. THE CONCRETE EDGES ALONG THE LONGITUDINAL CLOSURE POURS IN THE APPROACH SLABS SHALL BE TREATED TO PROVIDE A ROUGHENED/EXPOSED AGGREGATE SURFACE. THAT AMPLITUDE OF THE EXPOSED AGGREGATE SHALL BE A MINIMUM OF 1/8" AND BE COMPLETED PRIOR TO ERECTION OF THE BEAMS. THE FABRICATOR SHALL INDICATE THE METHOD USED TO ACHIEVE THIS PROFILE ON THE FABRICATION DRAWINGS AND METHOD USED TO PROTECT THE REINFORCING STEEL.

68. FILL APPROACH SLAB CLOSURE POURS WITH HPC RAPID SET CONCRETE IN ACCORDANCE WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)". CONCRETE SHALL HAVE A 28 DAY MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.

69. GROUT USED TO FILL DOWEL DUCTS IN THE PRECAST APPROACH SLABS FOR DOWEL CONNECTIONS SHALL BE MORTAR, TYPE IV IN ACCORDANCE WITH SECTION 540- PRECAST CONCRETE. ALL COSTS ASSOCIATED WITH PROVIDING AND PLACING GROUT FOR THE APPROACH SLAB DOWEL CONNECTIONS SHALL BE INCLUDED IN THE BID PRICE FOR THE APPROPRIATE PRECAST APPROACH SLAB OPTION.

70. THE FABRICATOR MAY ALTER THE DESIGN DETAILED WITHIN THESE PLANS TO ACCOMMODATE THEIR SPECIFIC OPERATION. THIS ALTERATION SHALL BE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT.

71. THE APPROACH SLABS ARE TO BE SET AT THE GIVEN ELEVATIONS IN ORDER TO ACCOMMODATE THE ROADWAY GEOMETRY. THE PAVEMENT OVER THE APPROACH SLAB WILL VARY TO ACCOUNT FOR THE DIFFERENCE BETWEEN THE TOP OF SLAB ELEVATIONS AND THE FINISH GRADE. A MINIMUM OF 3" PAVEMENT SHALL BE MAINTAINED OVER THE APPROACH SLABS.

H-PILES

72. TO PREVENT DAMAGE TO THE PILES, PILE SHOES ARE REQUIRED AND SHALL CONFORM TO SUBSECTION 505.04 (f).

73. ABUTMENT PILES
    A. THE PILES SHALL BE HP 14x89.
    B. RESISTANCE FACTOR = 0.65.
    C. THE PILES SHALL BE DRIVEN TO NOMINAL PILE DRIVING RESISTANCE (RNDR) OF 328 KIPS, PROVIDED A MINIMUM PENETRATION OF 29 FEET BELOW THE BOTTOM OF PILE CAP HAS BEEN ACHIEVED.

74. A MINIMUM OF ONE DYNAMIC TEST PER ABUTMENT IS REQUIRED DURING PILE INSTALLATION. PAYMENT WILL BE MADE UNDER ITEM 505.45, "DYNAMIC PILE LOADING TEST".

75. THE TOPS OF THE PILES AFTER DRIVING SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN 5 DEGREES. THE CONTRACTOR SHALL DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER HOW THE TOLERANCES WILL BE MET. THESE MEASURES SHALL BE DEMONSTRATED IN A SUBMITTAL TO BE ACCEPTED BEFORE PILE DRIVING COMMENCES.

76. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTHS MAY VARY.

BRIDGE RAILING

77. ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.

78. PRIOR TO GALVANIZING THE ASSEMBLED POST, GRIND ALL EDGES TO A MINIMUM RADIUS OF 1/16".

79. ALL POSTS SHALL BE SET NORMAL TO GRADE.

80. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO BRIDGE POSTS AND PREFERABLY TO AT LEAST 4 POSTS.

81. HOLES IN RAILS FOR TUBE ATTACHMENT MAY BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO INSTALLATION.

82. BOLTS SHALL BE TORQUED SNUG TIGHT (APPROXIMATELY 100 FT-LB).

83. RAIL TUBES SHALL BE ATTACHED USING ¾" FULL DIAMETER BODY ASTM A 449 (TYPE I) ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE.

84. SEE STANDARD DRAWING G-1 FOR DETAILS OF DELINEATORS. A DELINEATOR SHALL BE INSTALLED AT 30 FOOT SPACING OR THE NEAREST POST. WHITE IS TO BE INSTALLED ON THE DRIVER'S RIGHT. PAYMENT FOR DELINEATORS SHALL BE INCIDENTAL TO OTHER ITEMS.

85. PANEL RECESSES SHALL BE APPLIED TO THE INSIDE FACE OF THE CONCRETE PORTION OF RAIL.

86. BRIDGE RAILING SHALL HAVE A RUBBED FINISH IN ACCORDANCE WITH SECTION 501.

MISCELLANEOUS

87. EXISTING LIGHT POLES SHALL BE REMOVED AND RESET. ANY DAMAGE TO THE LIGHT POLES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COST FOR REMOVING AND RESETTING THE LIGHT POLES WILL BE PAID FOR UNDER ITEM 679.25, "REMOVING AND RESETTING LIGHT POLE".

88. CONTRACTOR SHALL HAVE A LICENSED ELECTRICIAN PERFORM ANY ELECTRIC WORK. ELECTRICIAN SHALL SPECIFY WIRING NEEDED FOR THE LIGHTS.

89. 4" PVC CONDUIT SHALL BE PROVIDED FOR FUTURE UTILITIES IN THE BRIDGE SIDEWALK AND SHALL BE PAID FOR UNDER ITEM 678.21, "ELECTRICAL CONDUIT (4")(PVC)".

90. JUNCTION BOXES TO BE LOCATED ON ALL FOUR APPROACH CORNERS TO THE BRIDGE. UTILITY DUCTS ON BRIDGE SHALL TERMINATE AT THE JUNCTION BOXES.

91. ONCE THE PBUs HAVE BEEN PLACED AND THE LONGITUDINAL JOINTS POURED AND CURED, DIAMOND GRIND THE SURFACE FOR A DEPTH OF NO MORE THAN ½" TO LEVEL THE DECK. COST FOR THIS WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR 900.670, "SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)".

92. ELEVATIONS FOR INLET AND OUTLET OF PROPOSED 18" CPEP(SL) CONNECTION TO EXISTING 48" CGMP SHALL BE FIELD VERIFIED PRIOR TO THE CONSTRUCTION TO ENSURE THAT VTRANS MINIMUM SLOPE REQUIREMENTS ARE MET. CONNECTION TO THE 48" CGMP SHALL BE INCIDENTAL TO THE 18" CPEP(SL) ITEM.

93. EXISTING UTILITIES SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR.

CONCRETE		REINFORCING STEEL	
STRUCTURAL ELEMENT:	CONTRACT ITEM:	TO MEET THE REQUIREMENTS FOR:	PAYMENT TO BE INCLUDED IN:
PBUs	ITEM 900.640, "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (FPQ)"	REINFORCING STEEL, LEVEL III	ITEM 900.640, "SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (FPQ)"
PRECAST SUBSTRUCTURE	ITEM 540.10, "PRECAST CONCRETE STRUCTURE" OR ITEM 900.645, "SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)", AS APPROPRIATE.	REINFORCING STEEL, LEVEL I (EPOXY COATED)	ITEM 540.10, "PRECAST CONCRETE STRUCTURE" OR ITEM 900.645, "SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)", AS APPROPRIATE.
ABUTMENT CLOSURE POUR CONCRETE*	ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"	REINFORCING STEEL, LEVEL III	ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"
SUPERSTRUCTURE CLOSURE POUR CONCRETE	ITEM 900.608, "SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE) (FPQ)"	REINFORCING STEEL, LEVEL III	ITEM 900.608, "SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"
APPROACH SLAB CLOSURE POUR CONCRETE	ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)"	REINFORCING STEEL, LEVEL III	ITEM 540.10, "PRECAST CONCRETE STRUCTURE" OR ITEM 900.645, "SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE), AS APPROPRIATE.
APPROACH SLABS	ITEM 540.10, "PRECAST CONCRETE STRUCTURE" OR ITEM 900.645, "SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)", AS APPROPRIATE.	REINFORCING STEEL LEVEL III	ITEM 540.10, "PRECAST CONCRETE STRUCTURE" OR ITEM 900.645, "SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)", AS APPROPRIATE.
CAST-IN-PLACE WINGWALLS/CHEEKWALLS	ITEM 501.33, "CONCRETE, HIGH PERFORMANCE CLASS A"	REINFORCING STEEL LEVEL III	ITEM 507.13, "REINFORCING STEEL, LEVEL III"
BRIDGE SIDEWALK	ITEM 501.33, "CONCRETE, HIGH PERFORMANCE CLASS A"	REINFORCING STEEL LEVEL III	ITEM 507.13, "REINFORCING STEEL, LEVEL III"
BRIDGE PARAPET	ITEM 900.640, "SPECIAL PROVISION (BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION)(COATED BLACK)"	REINFORCING STEEL LEVEL III	ITEM 900.640, "SPECIAL PROVISION (BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION)(COATED BLACK)"

* ABUTMENT CLOSURE POUR CONCRETE SHALL INCLUDE THE CONCRETE FOR THE PILE VOIDS AND ALL CONCRETE PLACED BELOW THE APPROACH SLAB ELEVATION.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068pn.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
PROJECT NOTES (2 OF 2)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 7 OF 73

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

ROADWAY	EROSION CONTROL	UTILITIES	BRIDGE	FULL C.E.	WATERLINE
1					
1150					
55					
			505		
205		40			
5					
1					
			550		
190		35	285		
1450					
915					
11					
1					
			65		
			1		
			850		
			2		
			9000		
			385		
			40		
			165		
			55		
			1		
			1		
			1		
			1		
			1		
			1		
			1		
			1		
			1		

TOTALS

GRAND TOTAL	FINAL
1	
1150	
55	
505	
245	
5	
1	
550	
510	
1450	
915	
11	
1	
65	
1	
850	
2	
9000	
385	
40	
165	
55	
1	
1	
1	
1	
1	
1	
1	
1	
1	
1	

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER	ROUND
LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	
CY	COMMON EXCAVATION	203.15	
CY	SOLID ROCK EXCAVATION	203.16	
CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	
CY	TRENCH EXCAVATION OF EARTH	204.20	
CY	TRENCH EXCAVATION OF ROCK	204.21	
CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	
CY	STRUCTURE EXCAVATION	204.25	
CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	
SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10	
CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
CWT	EMULSIFIED ASPHALT	404.65	
LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	
CY	CONCRETE, HIGH PERFORMANCE CLASS A	501.33	
LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10	
LF	STEEL PILING, HP 14 X 89	505.18	
EACH	DYNAMIC PILE LOADING TEST	505.45	
LB	REINFORCING STEEL, LEVEL III	507.13	
SY	LONGITUDINAL DECK GROOVING	509.10	
GAL	WATER REPELLENT, SILANE	514.10	
LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10	
LF	JOINT SEALER, HOT POURED	524.11	
EACH	PARTIAL REMOVAL OF STRUCTURE	529.20	
	BEGIN OPTION AA		
LS	PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 1)	540.10	
LS	SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE)(ABUTMENT NO. 1)	900.645	
	END OPTION AA		
	BEGIN OPTION BB		
LS	PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 2)	540.10	
LS	SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE)(ABUTMENT NO. 2)	900.645	
	END OPTION BB		
	BEGIN OPTION CC		
LS	PRECAST CONCRETE STRUCTURE (APPROACH SLAB NO. 1)	540.10	
LS	SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE)(APPROACH SLAB NO. 1)	900.645	
	END OPTION CC		
	BEGIN OPTION DD		
LS	PRECAST CONCRETE STRUCTURE (APPROACH SLAB NO. 2)	540.10	
LS	SPECIAL PROVISION (CONTRACTOR FABRICATED PRECAST CONCRETE STRUCTURE)(APPROACH SLAB NO. 2)	900.645	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORKS SUMMARY
1150	CY	COMMON EXCAVATION (1150 * 1.0)
379	CY	UNCLASSIFIED CHANNEL EXCAVATION (505 * 0.75)
184	CY	TRENCH EXCAVATION OF EARTH (250 * 0.75)
413	CY	STRUCTURE EXCAVATION (550 * 0.75)
2125	CY	SUBTOTAL
17	CY	ROUNDING
2150	CY	TOTAL
2150	CY	FILL AVAILABLE
0	CY	FILL REQUIRED
2,150	CY	TOTAL WASTE
		SPECIAL PROVISION
		(BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)
335	TONS	TYPE IVS - WEARING COURSE
325	TONS	TYPE IIS - BASE COURSE
0	TONS	ROUNDING
660	TONS	TOTAL

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068qs.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
QUANTITY SHEET #1

PLOT DATE: 07/21/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 8 OF 72

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				ROADWAY	EROSION CONTROL	UTILITIES	BRIDGE	FULL C.E.	WATERLINE	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
													END OPTION DD					
				225						225		LF	18" CPEP(SL)	601.2615				
				3						3		EACH	PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE	604.18				
				2						2		EACH	CHANGING ELEVATION OF DROP INLETS, CATCH BASINS, OR MANHOLES	604.40				
				1						1		EACH	CHANGING ELEVATION OF SEWER MANHOLES	604.42				
				10						10		MGAL	DUST CONTROL WITH WATER	609.10				
					250					250		CY	STONE FILL, TYPE III	613.12				
				460						460		LF	VERTICAL GRANITE CURB	616.21				
				25						25		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28				
				510						510		LF	REMOVAL OF EXISTING CURB	616.41				
				245						245		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH	618.10				
				35						35		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 8 INCH	618.11				
				40						40		SF	DETECTABLE WARNING SURFACE	618.30				
				73						73		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
									2	2		EACH	ADJUST ELEVATION OF VALVE BOX	629.20				
									72	72		LF	DUCTILE IRON PIPE, CEMENT-LINED (8")	629.24				
									3	3		EACH	GATE VALVE WITH VALVE BOX (8")	629.27				
									1	1		LS	TRANSFER TO NEW SYSTEM, WATER SYSTEM	629.42				
				80						80		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
				500						500		HR	FLAGGERS	630.15				
								1		1		LS	FIELD OFFICE, ENGINEERS	631.10				
								1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
								1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
								3000		3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
				1						1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
				8						8		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15				
				1115						1115		LF	DURABLE 4 INCH WHITE LINE	646.400				
				1060						1060		LF	DURABLE 4 INCH YELLOW LINE	646.410				
				310						310		LF	DURABLE 12 INCH WHITE LINE	646.460				
				45						45		LF	DURABLE 24 INCH STOP BAR	646.480				
				8						8		EACH	DURABLE LETTER OR SYMBOL	646.490				
					450					450		SY	GEOTEXTILE UNDER STONE FILL	649.31				
					130					130		SY	GEOTEXTILE FOR SILT FENCE	649.51				
					90					90		SY	GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED	649.515				
					3					3		LB	SEED	651.15				
					25					25		LB	FERTILIZER	651.18				
					1					1		TON	AGRICULTURAL LIMESTONE	651.20				
					1					1		TON	HAY MULCH	651.25				
					25					25		CY	TOPSOIL	651.35				
					175					175		SY	GRUBBING MATERIAL	651.40				

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068qs.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
QUANTITY SHEET #2

PLOT DATE: 07/21/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 9 OF 72

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				ROADWAY	EROSION CONTROL	UTILITIES	BRIDGE	FULL C.E.	WATERLINE	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
					1					1		LS	EPSC PLAN	652.10				
					80					80		HR	MONITORING EPSC PLAN	652.20				
					1					1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30				
					12					12		SY	TEMPORARY EROSION MATTING	653.20				
					30					30		CY	VEHICLE TRACKING PAD	653.35				
					7					7		EACH	INLET PROTECTION DEVICE, TYPE I	653.40				
					1					1		EACH	FILTER BAG	653.45				
					355					355		LF	BARRIER FENCE	653.50				
				29						29		SF	TRAFFIC SIGNS, TYPE A	675.20				
				75						75		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
				9						9		EACH	REMOVING SIGNS	675.50				
				1						1		EACH	ERECTING SALVAGED SIGNS	675.60				
						1500				1500		LF	ELECTRICAL CONDUIT (4")(PVC)	678.21				
						300				300		LF	WIRED CONDUIT (2")(PVC)	678.23				
						4				4		EACH	JUNCTION BOX	678.26				
						175				175		LF	ELECTRICAL CONDUIT SLEEVE (6")(PVC)	678.30				
							4			4		EACH	REMOVING AND RESETTING LIGHT POLE	679.25				
							4			4		EACH	LUMINAIRE	679.50				
							1			1		EACH	POWER DROP STANCHION, STREET LIGHTING	679.55				
				1						1		LU	PRICE ADJUSTMENT, FUEL (N.A.B.I.)	690.50				
							65			65		CY	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)	900.608				
					15					15		CY	SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL)(TYPE III)	900.608				
							30			30		CY	SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE) (FPQ)	900.608				
				174720						174720		DL	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE)(N.A.B.I.)	900.615				
							6			6		EACH	SPECIAL PROVISION (CPM SCHEDULE)	900.620				
							4			4		EACH	SPECIAL PROVISION (GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM)(COATED BLACK)	900.620				
							220			220		LF	SPECIAL PROVISION (BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION)(COATED BLACK)	900.640				
				160						160		LF	SPECIAL PROVISION (DURABLE CROSSWALK MARKING, IMPRINTED/COLORIZED)	900.640				
							642			642		LF	SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE) (FPQ)	900.640				
							1			1		LS	SPECIAL PROVISION (METALLIZING STRUCTURAL STEEL)	900.645				
				1						1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645				
									1	1		LS	SPECIAL PROVISION (WATER MAIN ON BRIDGE)(8")	900.645				
				1						1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650				
				1						1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650				
							3450			3450		SF	SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)	900.670				
				660						660		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068qs.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
QUANTITY SHEET #3

PLOT DATE: 07/21/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 10 OF 72

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

THE SYMBOLOGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLOGY. THE SYMBOLOGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLOGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R.O.W. ABBREVIATIONS (CODES) & SYMBOLS

POINT	CODE	DESCRIPTION
	CH	CHANNEL EASEMENT
	CONST	CONSTRUCTION EASEMENT
	CUL	CULVERT EASEMENT
	D&C	DISCONNECT & CONNECT
	DIT	DITCH EASEMENT
	DR	DRAINAGE EASEMENT
	DRIVE	DRIVEWAY EASEMENT
	EC	EROSION CONTROL
	HWY	HIGHWAY EASEMENT
	I&M	INSTALL & MAINTAIN EASEMENT
	LAND	LANDSCAPE EASEMENT
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
●	IPNS	IRON PIN SET
◎	IPNS	IRON PIN TO BE SET
⊠	CALC	EXISTING ROW POINT
○	PROW	PROPOSED ROW POINT
[LENGTH]		LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT	CODE	DESCRIPTION
	APL	BOUND APPARENT LOCATION
	BM	BENCHMARK
	BND	BOUND
	CB	CATCH BASIN
	COMB	COMBINATION POLE
	DITHR	DROP INLET THROATED DNC
	EL	ELECTRIC POWER POLE
	FPOLE	FLAGPOLE
	GASFIL	GAS FILLER
	GP	GUIDE POST
	GSO	GAS SHUT OFF
	GUY	GUY POLE
	GUYW	GUY WIRE
	GV	GATE VALUE
	H	TREE HARDWOOD
	HCTRL	CONTROL HORIZONTAL
	HVCTRL	CONTROL HORIZ. & VERTICAL
	HYD	HYDRANT
	IP	IRON PIN
	IPIPE	IRON PIPE
	LI	LIGHT - STREET OR YARD
	MB	MAILBOX
	MH	MANHOLE (MH)
	MM	MILE MARKER
	PM	PARKING METER
	PMK	PROJECT MARKER
	POST	POST STONE/WOOD
	RRSIG	RAILROAD SIGNAL
	RRSL	RAILROAD SWITCH LEVER
	S	TREE SOFTWOOD
	SAT	SATELLITE DISH
	SHRUB	SHRUB
	SIGN	SIGN
	STUMP	STUMP
	TEL	TELEPHONE POLE
	TIE	TIE
	TSIGN	SIGN W/DOUBLE POST
	VCTRL	CONTROL VERTICAL
	WELL	WELL
	WSO	WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADUIS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLOGY

UNDERGROUND UTILITIES

- UGU — UTILITY (GENERIC-UNKNOWN)
- UT — TELEPHONE
- UE — ELECTRIC
- UC — CABLE (TV)
- UEC — ELECTRIC+CABLE
- UET — ELECTRIC+TELEPHONE
- UCT — CABLE+TELEPHONE
- UECT — ELECTRIC+CABLE+TELEP.
- G — GAS LINE
- W — WATER LINE
- S — SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)

- AGU — UTILITY (GENERIC-UNKNOWN)
- T — TELEPHONE
- E — ELECTRIC
- C — CABLE (TV)
- EC — ELECTRIC+CABLE
- ET — ELECTRIC+TELEPHONE
- AER E&T — ELECTRIC+TELEPHONE
- CT — CABLE+TELEPHONE
- ECT — ELECTRIC+CABLE+TELEP.
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

- TOP OF CUT SLOPE
- TOE OF FILL SLOPE
- STONE FILL
- BOTTOM OF DITCH ℄
- CULVERT PROPOSED
- STRUCTURE SUBSURFACE
- PDF — PROJECT DEMARCATION FENCE
- BF — BARRIER FENCE
- TREE PROTECTION ZONE (TPZ)
- STRIPING LINE REMOVAL
- SHEET PILES

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

- TOWN LINE — TOWN BOUNDARY LINE
- COUNTY LINE — COUNTY BOUNDARY LINE
- STATE LINE — STATE BOUNDARY LINE
- PROPOSED STATE R.O.W. (LIMITED ACCESS)
- PROPOSED STATE R.O.W.
- STATE ROW (LIMITED ACCESS)
- STATE ROW
- TOWN ROW
- PERMANENT EASEMENT LINE (P)
- TEMPORARY EASEMENT LINE (T)
- SURVEY LINE
- P/L — PROPERTY LINE (P/L)
- SR SR SR — SLOPE RIGHTS
- 6f — 6F PROPERTY BOUNDARY
- 4f — 4F PROPERTY BOUNDARY
- HAZ — HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

- FILTER CURTAIN
- SILT FENCE
- SILT FENCE WOVEN WIRE
- CHECK DAM
- DISTURBED AREAS REQUIRING RE-VEGETATION
- EROSION MATTING

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

- WETLAND BOUNDARY
- RIPARIAN BUFFER ZONE
- WETLAND BUFFER ZONE
- SOIL TYPE BOUNDARY
- T&E — THREATENED & ENDANGERED SPECIES
- HAZ — HAZ — HAZARDOUS WASTE AREA
- AG — AGRICULTURAL LAND
- HABITAT — FISH & WILDLIFE HABITAT
- FLOOD PLAIN — FLOOD PLAIN
- OHW — ORDINARY HIGH WATER (OHW)
- STORM WATER
- USDA FOREST SERVICE LANDS
- WILDLIFE HABITAT SUIT/CONN

ARCHEOLOGICAL & HISTORIC

- ARCH — ARCHEOLOGICAL BOUNDARY
- HISTORIC DIST — HISTORIC DISTRICT BOUNDARY
- HISTORIC — HISTORIC AREA
- (H) — HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

- ROAD EDGE PAVEMENT
- ROAD EDGE GRAVEL
- DRIVEWAY EDGE
- DITCH
- FOUNDATION
- FENCE (EXISTING)
- FENCE WOOD POST
- FENCE STEEL POST
- GARDEN
- ROAD GUARDRAIL
- RAILROAD TRACKS
- CULVERT (EXISTING)
- STONE WALL
- WALL
- WOOD LINE
- BRUSH LINE
- HEDGE
- BODY OF WATER EDGE
- LEDGE EXPOSED

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-I(42)

FILE NAME: z10J068LegendSheet.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: VTRANS
CONVENTIONAL SYMBOLOGY LEGEND

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET II OF 73

GPS CONTROL POINTS

VCTRL #100

U 61 1980

NORTH = 324010.8480
EAST = 1597887.2000
ELEV. = 960.5460

GENERAL LOCATION LUDLOW, VT. MARK IS LOCATED 2.4 MI (3.9 KM) EAST ALONG VT ROUTE 103 FROM THE POST OFFICE IN LUDLOW, SET NORTH OF THE HIGHWAY ON THE SOUTH SIDE OF AN OUTCROP OF BEDROCK IN A FIELD JUST WEST OF A WHITE WOOD FRAMED HOUSE, 161 FT (49 M) WEST OF THE NORTHWEST CORNER OF THE HOUSE, 141 FT (43 M) NORTH OF THE CENTER LINE OF THE HIGHWAY, 21 FT (6.4 M) EAST OF THE WEST END OF THE ROCK OUTCROP. THE MARK IS 5.91 FT (1.80 M) NORTHWEST FROM A WITNESS POST. THE MARK IS 2.56 FT (0.78 M) ABOVE GROUND.

HVCTRL #101

BRIGADE AZ MK 2006

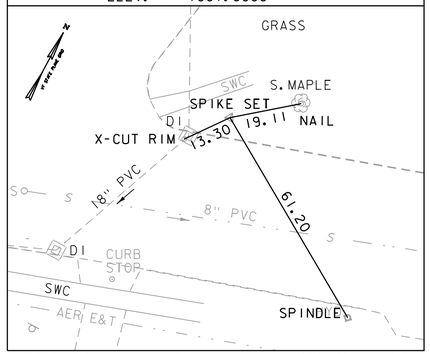
NORTH = 326083.6150
EAST = 1591965.7870
ELEV. = 971.7550

GENERAL LOCATION LUDLOW, VT. THE MARK IS LOCATED 1 MILE EAST OF VT ROUTE 100 (ANDOVER ST). IT IS SET 0.10 FT (3 CM) BELOW GROUND SURFACE IN THE TOP OF A 1.0 FT (30 CM) DIAMETER CONCRETE MONUMENT, JUST EAST OF BROOKHAVEN RESORT. IT IS 23.3 FT (7.1 M) SOUTHWEST OF AND ABOUT 1.0 FT (0.3 M) LOWER THAN THE CENTERLINE OF VT ROUTE 103 (MAIN ST), 70.5 FT (21.5 M) SE OF POLE NO 7/24, 48.9 FT (14.9 M) NW OF POLE NO 7/25, 46.3 FT (14.1 M) EAST OF A 1.5 INCH DIAMETER IRON PIPE WHICH PROJECTS 1.6 FT (0.5 M) ABOVE GROUND SURFACE, AND 86.0 FT (26.2 M) ENE OF THE NE CORNER OF A WOODEN FENCE ENCLOSURE FOR A TENNIS COURT.

TRAVERSE TIES

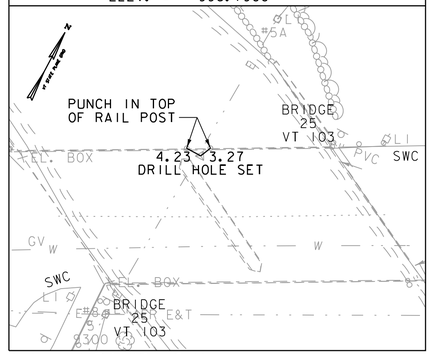
HVCTRL #1

NORTH = 326862.4150
EAST = 1588373.8580
ELEV. = 1001.6000



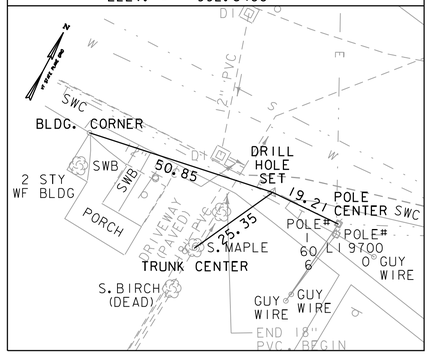
HVCTRL #2

NORTH = 326740.8300
EAST = 1588143.1200
ELEV. = 996.7900



HVCTRL #3

NORTH = 326637.3220
EAST = 1588009.6620
ELEV. = 992.6400



• Main Traverse Completed 11/29/10 by T.J.Gaudet and B.M.Klinefelter

DATUM

VERTICAL NAVD 88

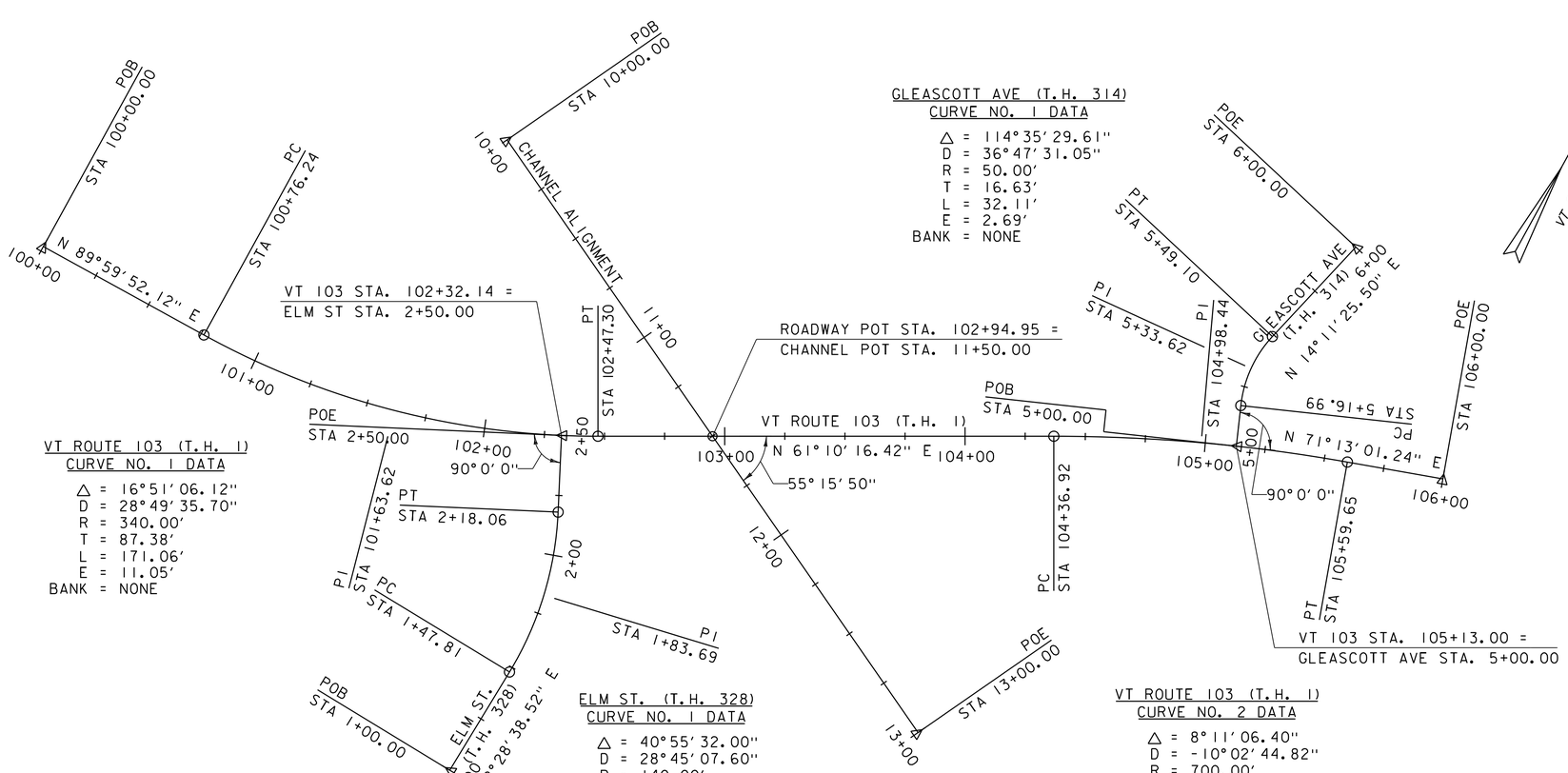
HORIZONTAL NAD 83 (07)

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068ti.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: B.M. KLINEFELTER
TIE SHEET

PLOT DATE: 8/23/2016
DRAWN BY: B.M. KLINEFELTER
CHECKED BY: A.P. GUYETTE
SHEET 12 OF 73

VHB 57435



GLEASCOTT AVE (T.H. 314)
CURVE NO. 1 DATA

△ = 114°35'29.61"
D = 36°47'31.05"
R = 50.00'
T = 16.63'
L = 32.11'
E = 2.69'
BANK = NONE

VT ROUTE 103 (T.H. 1)
CURVE NO. 1 DATA

△ = 16°51'06.12"
D = 28°49'35.70"
R = 340.00'
T = 87.38'
L = 171.06'
E = 11.05'
BANK = NONE

ELM ST. (T.H. 328)
CURVE NO. 1 DATA

△ = 40°55'32.00"
D = 28°45'07.60"
R = 140.00'
T = 35.88'
L = 70.25'
E = 4.53'
BANK = NONE

VT ROUTE 103 (T.H. 1)
CURVE NO. 2 DATA

△ = 8°11'06.40"
D = -10°02'44.82"
R = 700.00'
T = 61.52'
L = 122.73'
E = 2.70'
BANK = NONE

VT ROUTE 103 (T.H. 1) ALIGNMENT

HORIZONTAL ALIGNMENT NAME: VT103proposed

		STATION	NORTHING	EASTING
ELEMENT:	LINEAR			
	POB	100+00.00	326656.3297	1587862.5569
	PC	100+76.24	326656.3326	1587938.7921
	TANGENT DIRECTION:	N 89°59'52.12" E		
	TANGENT LENGTH:	76.24		
ELEMENT:	CIRCULAR			
	PC	100+76.24	326656.3326	1587938.7921
	PI	101+63.62	326656.3359	1588026.1733
	CC		326996.3326	1587938.7791
	PT	102+47.30	326870.0635	1588328.5140
	RADIUS:	340.00		
	DELTA:	28°49'35.70" LEFT		
	DEGREE OF CURVATURE (ARC):	16°51'06.12"		
	LENGTH:	171.06		
	TANGENT:	87.38		
	CHORD:	169.26		
	MIDDLE ORDINATE:	10.70		
	EXTERNAL:	11.05		
ELEMENT:	LINEAR			
	PT	102+47.30	326698.4706	1588102.7249
	POE	104+36.92	326789.9063	1588268.8482
	TANGENT DIRECTION:	N 61°10'16.42" E		
	TANGENT LENGTH:	189.62		
ELEMENT:	CIRCULAR			
	PC	104+36.92	326789.9063	1588268.8482
	PI	104+98.44	326819.5727	1588322.7471
	CC		326176.6610	1588606.3837
	PT	105+59.65	326839.3824	1588380.9945
	RADIUS:	700.00		
	DELTA:	10°02'44.82" RIGHT		
	DEGREE OF CURVATURE (ARC):	08°11'06.40"		
	LENGTH:	122.73		
	TANGENT:	61.52		
	CHORD:	122.58		
	MIDDLE ORDINATE:	2.69		
	EXTERNAL:	2.70		
ELEMENT:	LINEAR			
	PT	105+59.65	326839.3824	1588380.9945
	POE	106+00.00	326852.3738	1588419.1934
	TANGENT DIRECTION:	N 71°13'01.24" E		
	TANGENT LENGTH:	40.35		

ELM ST. (T.H. 328) ALIGNMENT

HORIZONTAL ALIGNMENT NAME: TH328prop

		STATION	NORTHING	EASTING
ELEMENT:	LINEAR			
	POB	1+00.00	326547.0366	1588115.6916
	PC	1+47.81	326594.8020	1588117.7581
	TANGENT DIRECTION:	N 2°28'38.52" E		
	TANGENT LENGTH:	47.81		
ELEMENT:	CIRCULAR			
	PC	1+47.81	326594.8020	1588117.7581
	PI	1+83.69	326630.6520	1588119.3092
	CC		326600.8535	1587977.8890
	PT	2+18.06	326662.8281	1588103.4244
	RADIUS:	140.00		
	DELTA:	28°45'07.60" LEFT		
	DEGREE OF CURVATURE (ARC):	40°55'32.00"		
	LENGTH:	70.25		
	TANGENT:	35.88		
	CHORD:	69.52		
	MIDDLE ORDINATE:	4.38		
	EXTERNAL:	4.53		
ELEMENT:	LINEAR			
	PT	2+18.06	326662.8281	1588103.4244
	POE	2+50.00	326691.4608	1588089.2889
	TANGENT DIRECTION:	N 26°16'29.08" W		
	TANGENT LENGTH:	31.93		

GLEASCOTT AVE (T.H. 314) ALIGNMENT

HORIZONTAL ALIGNMENT NAME: TH314prop

		STATION	NORTHING	EASTING
ELEMENT:	LINEAR			
	POB	5+00.00	326822.9009	1588337.3596
	PC	5+16.99	326838.5903	1588330.8283
	TANGENT DIRECTION:	N 22°36'05.55" W		
	TANGENT LENGTH:	16.99		
ELEMENT:	CIRCULAR			
	PC	5+16.99	326838.5903	1588330.8283
	PI	5+33.62	326853.9421	1588324.4375
	CC		326857.8063	1588376.9883
	PT	5+49.10	326870.0635	1588328.5140
	RADIUS:	50.00		
	DELTA:	36°47'31.05" RIGHT		
	DEGREE OF CURVATURE (ARC):	114°35'29.61"		
	LENGTH:	32.11		
	TANGENT:	16.63		
	CHORD:	31.56		
	MIDDLE ORDINATE:	2.56		
	EXTERNAL:	2.69		
ELEMENT:	LINEAR			
	PT	5+49.10	326870.0635	1588328.5140
	POE	6+00.00	326919.4089	1588340.9915
	TANGENT DIRECTION:	N 14°11'25.50" E		
	TANGENT LENGTH:	50.90		

CHANNEL ALIGNMENT

HORIZONTAL ALIGNMENT NAME: BR25channel

		STATION	NORTHING	EASTING
ELEMENT:	LINEAR			
	POB	10+00.00	326788.2249	1588010.1548
	POE	13+00.00	326654.6712	1588278.7873
	TANGENT DIRECTION:	S 63°33'54.71" E		
	TANGENT LENGTH:	300.00		

0 30 60
SCALE IN FEET

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (07)

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068align.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: A.P. GUYETTE
ALIGNMENT LAYOUT SHEET

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 13 OF 73

VHB 57435

SOLID ROCK EXCAVATION
STA. 100+94 - 102+13, RT
STA. 102+10 - 102+56, LT
STA. 102+50 - 102+77, RT
STA. 103+39 - 104+71, LT
STA. 103+60 - 104+75, RT
STA. 1+58 - 2+28, RT

REMOVAL OF EXISTING CURB
STA. 100+94 - 101+16, RT
STA. 101+35 - 102+18, RT
STA. 102+16 - 102+57, LT
STA. 102+50 - 102+75, RT
STA. 103+43 - 103+82, LT
STA. 103+60 - 105+24, RT
STA. 104+34 - 104+70, LT
STA. 1+58 - 2+28, RT

VERTICAL GRANITE CURB
STA. 101+35 - 102+19, RT
STA. 102+10 - 102+44, LT
STA. 102+50 - 102+65, RT
STA. 103+54 - 103+88, LT
STA. 104+28 - 104+63, LT
STA. 103+75 - 105+25, RT
STA. 1+58 - 2+28, RT

PORTLAND CEMENT CONCRETE SIDEWALK, 8 INCH
STA. 103+88 - 104+28, LT

PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH
STA. 100+94 - 102+14, RT
STA. 102+10 - 102+42, LT
STA. 102+50 - 102+68, RT
STA. 103+51 - 103+88, LT
STA. 103+75 - 104+75, RT
STA. 104+28 - 104+71, LT
STA. 1+58 - 2+28, RT

CAST-IN-PLACE CONCRETE CURB, TYPE B
STA. 100+94 - 101+17, RT

SPECIAL PROVISION (GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM) (COATED BLACK)
STA. 102+27 - 102+40, LT
STA. 2+04 - 2+30 (102+68), RT
STA. 103+50 - 103+38, LT
STA. 103+78 - 103+93, RT

SPECIAL PROVISION (BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION) (COATED BLACK)
STA. 102+40 - 103+50, LT
STA. 102+68 - 103+78, RT

REMOVAL AND DISPOSAL OF GUARDRAIL
STA. 102+40 - 102+56, LT
STA. 102+66 - 102+77, RT
STA. 103+40 - 103+52, LT
STA. 103+63 - 104+79, RT

COLD PLANING, BITUMINOUS PAVEMENT
STA. 100+75 - 101+15, LT & RT
STA. 1+50 - 2+00, LT & RT (ELM ST.)
STA. 5+00 - 5+50, LT & RT (GLEASCOTT AVE)
STA. 104+75 - 105+75, LT & RT

CONSTRUCT 5' PAVED APRON
STA. 101+18 - 101+31, RT

CONSTRUCT 7' PAVED APRON
STA. 105+26 - 105+43, RT

CONSTRUCT 10' PAVED APRON
STA. 103+54 - 104+39, LT

CONSTRUCT 30' PAVED APRON
STA. 100+75 - 102+30, LT

EXISTING BRIDGE DATA

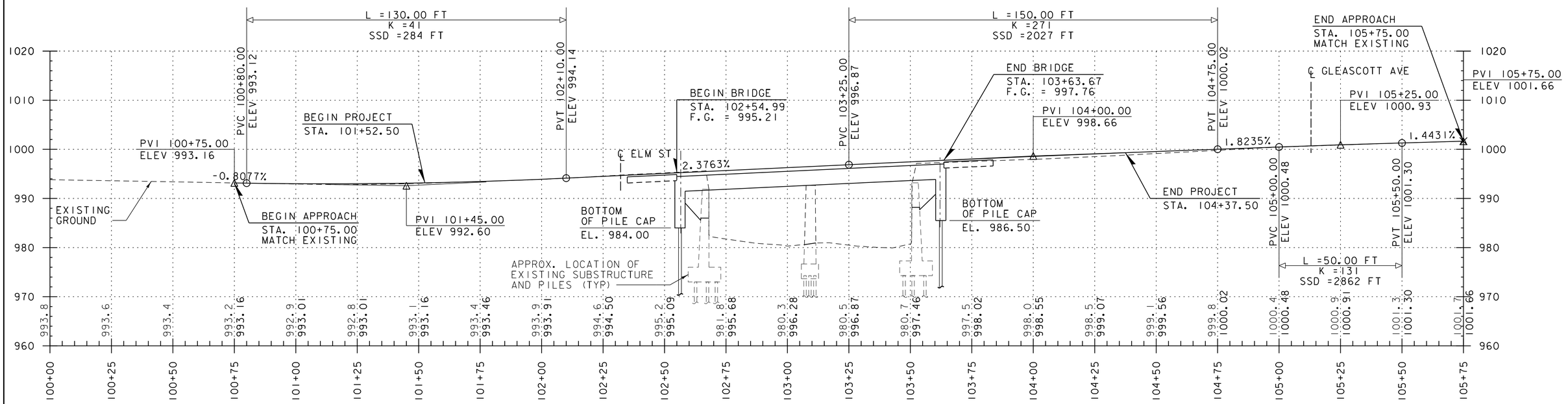
TWO SPAN CONCRETE T-BEAM BUILT IN 1928
SPAN LENGTH = 42'-0"
STRUCTURE LENGTH = 86'-0"
DECK WIDTH OUT TO OUT = 35'-8"
BRIDGE WIDTH CURB TO CURB = 23'-2"

NOTE:

1. FIRST 10' OF EXISTING WALKWAY SHALL BE ADJUSTED TO MATCH INTO INTO NEW GRADE OF SIDEWALK. WALKWAY BLOCKS SHALL BE CAREFULLY LIFTED AND PUT BACK ON THE SAME ALIGNMENT. COST FOR THIS WORK SHALL BE INCIDENTAL TO ALL THE PROJECT ITEMS.

PROJECT NAME: LUDLOW	
PROJECT NUMBER: BRF 025-1(42)	
FILE NAME: z10j068bdr_nul.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
LAYOUT SHEET	SHEET 14 OF 73

VHB 57435

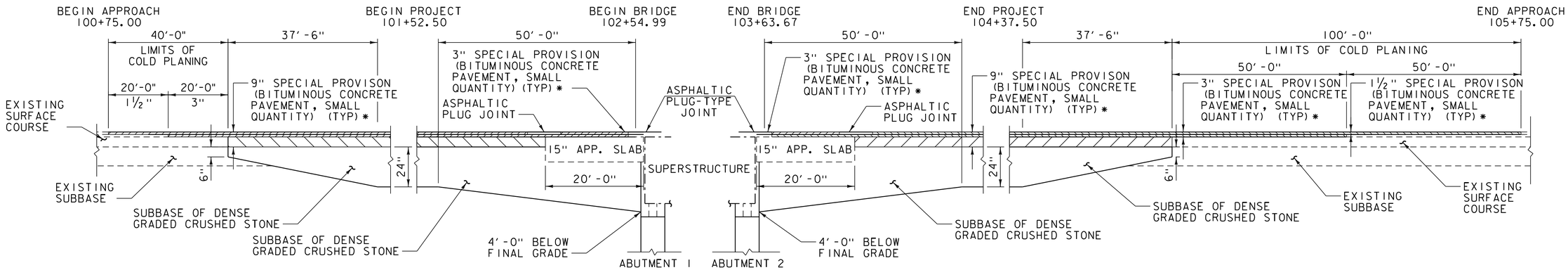


VERMONT ROUTE 103 (T.H. 1) PROFILE

SCALE 1" = 20' HORIZONTAL
1" = 10' VERTICAL

THE GRADES SHOWN TO THE NEAREST TENTH ARE THE ORIGINAL GROUND ELEVATIONS ALONG THE PROPOSED ALIGNMENT.

THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE FINISH GRADES ALONG THE PROPOSED ALIGNMENT.



* AT COLD PLANE 1½": (1) - 1½" LIFT OF TYPE IVS

AT COLD PLANE 3": (2) - 1½"" LIFTS OF TYPE IVS

AT 9" PAVEMENT: (2) - 1½" LIFTS OF TYPE IVS OVER
(2) - 3" LIFTS OF TYPE IIS

BEGIN PROJECT MATERIAL TRANSITION

NOT TO SCALE

END PROJECT MATERIAL TRANSITION

NOT TO SCALE

NOTES:

1. SEE TYPICAL ROADWAY SECTIONS FOR INFORMATION NOT SHOWN.
2. EMULSIFIED ASPHALT SHALL BE APPLIED AT A RATE OF 0.040 GAL/SY BETWEEN ALL LIFTS OF BITUMINOUS CONCRETE PAVEMENT AND ON THE EXISTING PAVEMENT AND THE APPROACH SLAB PRIOR TO PLACING THE FIRST LIFT, AS DIRECTED BY THE ENGINEER.

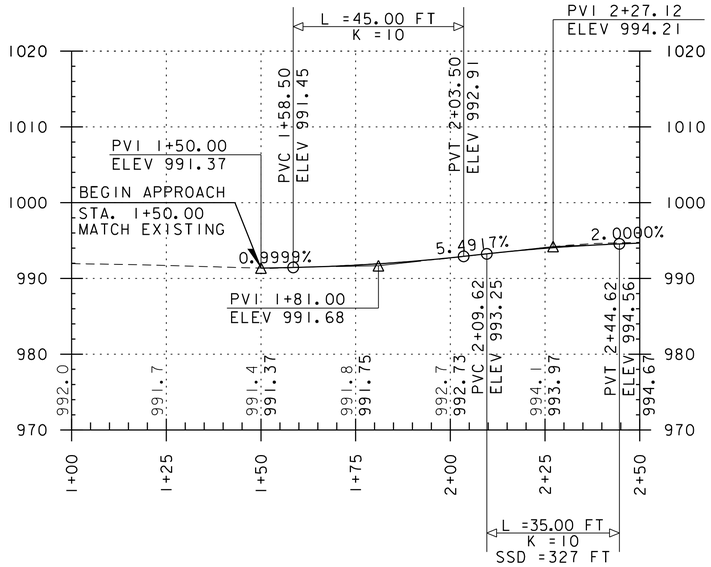
vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

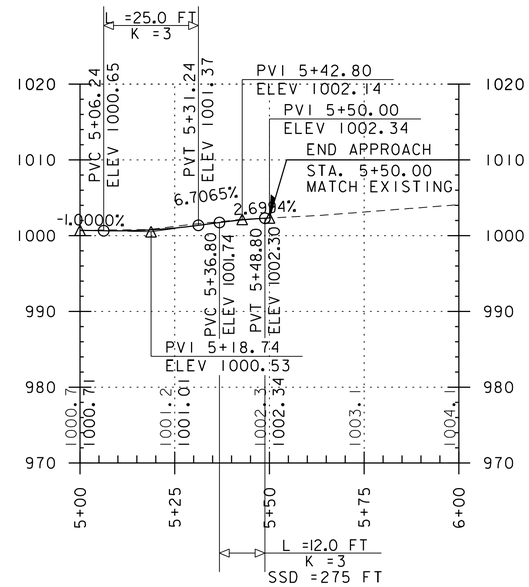
FILE NAME: z10j068pro.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
PROFILE SHEET

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 15 OF 73

VHB 57435



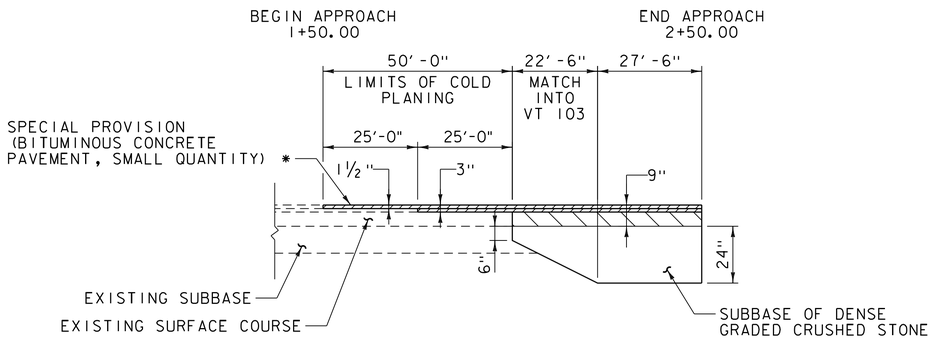
ELM ST. (T.H. 328) PROFILE
SCALE 1" = 20' HORIZONTAL
1" = 10' VERTICAL



GLEASCOTT AVE (T.H. 314) PROFILE
SCALE 1" = 20' HORIZONTAL
1" = 10' VERTICAL

THE GRADES SHOWN TO THE NEAREST TENTH ARE THE ORIGINAL GROUND ELEVATIONS ALONG THE PROPOSED ALIGNMENT.

THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE FINISH GRADES ALONG THE PROPOSED ALIGNMENT.



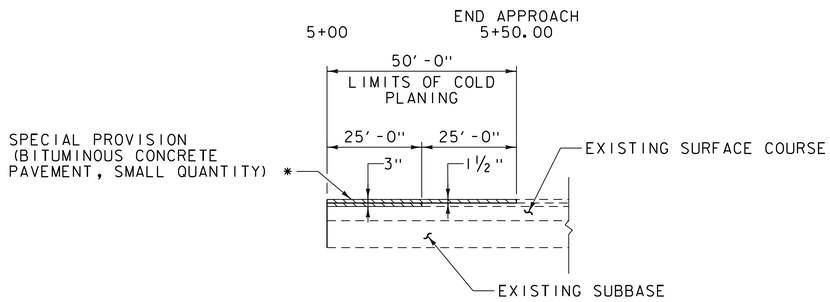
* AT COLD PLANE 1½": (1) - 1½" LIFT OF TYPE IVS

AT COLD PLANE 3": (2) - 1½" LIFTS OF TYPE IVS

AT 9" PAVEMENT:
(2) - 1½" LIFTS OF TYPE IVS OVER
(2) - 3" LIFTS OF TYPE IIS

BEGIN PROJECT MATERIAL TRANSITION (ELM ST.)
NOT TO SCALE

NOTE:
1. SEE TYPICAL ROADWAY SECTIONS FOR INFORMATION NOT SHOWN.



* AT COLD PLANE 1½": (1) - 1½" LIFT OF TYPE IVS

AT COLD PLANE 3": (2) - 1½" LIFTS OF TYPE IVS

END PROJECT MATERIAL TRANSITION
(GLEASCOTT AVE)
NOT TO SCALE

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068pro.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
SIDE ROAD PROFILE SHEET

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 16 OF 73

LEGEND

- TYPE III BARRICADE
- TYPE III (MOD) BARRICADE
- TRAFFIC BARRIER
- PCMS — PORTABLE CHANGEABLE MESSAGE SIGN

N

VT STATE PLANE GRID

BLACK RIVER

W20-3 — ROAD CLOSED AHEAD

ROAD CLOSED 500 FT — W20-3

100+00

TO MOUNT HOLLY

500'

500'

MAINTAIN 8'-0" LANE WIDTH (MIN)

25'-0"

5'-0" (MIN)

101+00

VT ROUTE 103 (T.H. 1) 102+00

2+50

103+00

104+00

105+00

5+00

TO CAVENDISH

106+00

2+00

1+00

~250'

PCMS

PCMS

PCMS

R9-9 MOUNTED ON TYPE III (MOD) BARRICADE — SIDEWALK CLOSED

M4-9bR — DETOUR

M4-9bR — DETOUR

ROAD CLOSED

R11-2 MOUNTED ON TYPE III (MOD) BARRICADE

R7-8M — RESERVED PARKING

GLEASCOTT AVE (T.H. 314)

6+00

R11-2 MOUNTED ON TYPE III (MOD) BARRICADE

ROAD CLOSED

TEMPORARY CROSSWALK (TYP)

ROAD CLOSED

R11-2 MOUNTED ON TYPE III (MOD) BARRICADE

SIDEWALK CLOSED

USE CROSSWALK

R9-9 AND R9-3b MOUNTED ON TYPE III (MOD) BARRICADE

ONE WAY

R6-2L

DO NOT ENTER

R5-1

TEMPORARY CURB RAMP (TYP)

ELM ST. (T.H. 328)

R11-2 MOUNTED ON TYPE III (MOD) BARRICADE

ROAD CLOSED

R9-11 MOUNTED ON TYPE III (MOD) BARRICADE

SIDEWALK CLOSED AHEAD

CROSS HERE

ROAD CLOSED AHEAD

W20-3

0 20 40

SCALE IN FEET

NOTES:

1. SEE TRAFFIC CONTROL PLAN SHEETS 2 THRU 6 FOR ADDITIONAL NOTES.
2. THE NUMBER OF TYPE III BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL ROADWAY CLOSURE REQUIREMENTS.
3. THE PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL DISPLAY THE MESSAGE SHOWN ON TRAFFIC CONTROL PLAN (6 OF 6) ONE WEEK (7 DAYS) PRIOR TO THE CLOSURE OF THE BRIDGE. THE PCMS SHALL NOT BE A PART OF THE DETOUR AND SHALL BE REMOVED ONCE THE DETOUR IS IMPLEMENTED AND THE BRIDGE IS CLOSED. PAYMENT FOR THESE SIGNS SHALL BE INCLUDED IN ITEM 641.15, "PORTABLE CHANGEABLE MESSAGE SIGN".
4. THE COSTS OF ALL ROADWAY CLOSURE SIGNS, SIGN POSTS, TYPE III BARRICADES, TEMPORARY LINE STRIPING, TEMPORARY CURB RAMPS, TEMPORARY TRAFFIC BARRIERS, ETC. WILL BE INCLUDED IN ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

vhb

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068tcpl.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
TRAFFIC CONTROL PLAN (1 OF 6)	SHEET 17 OF 73

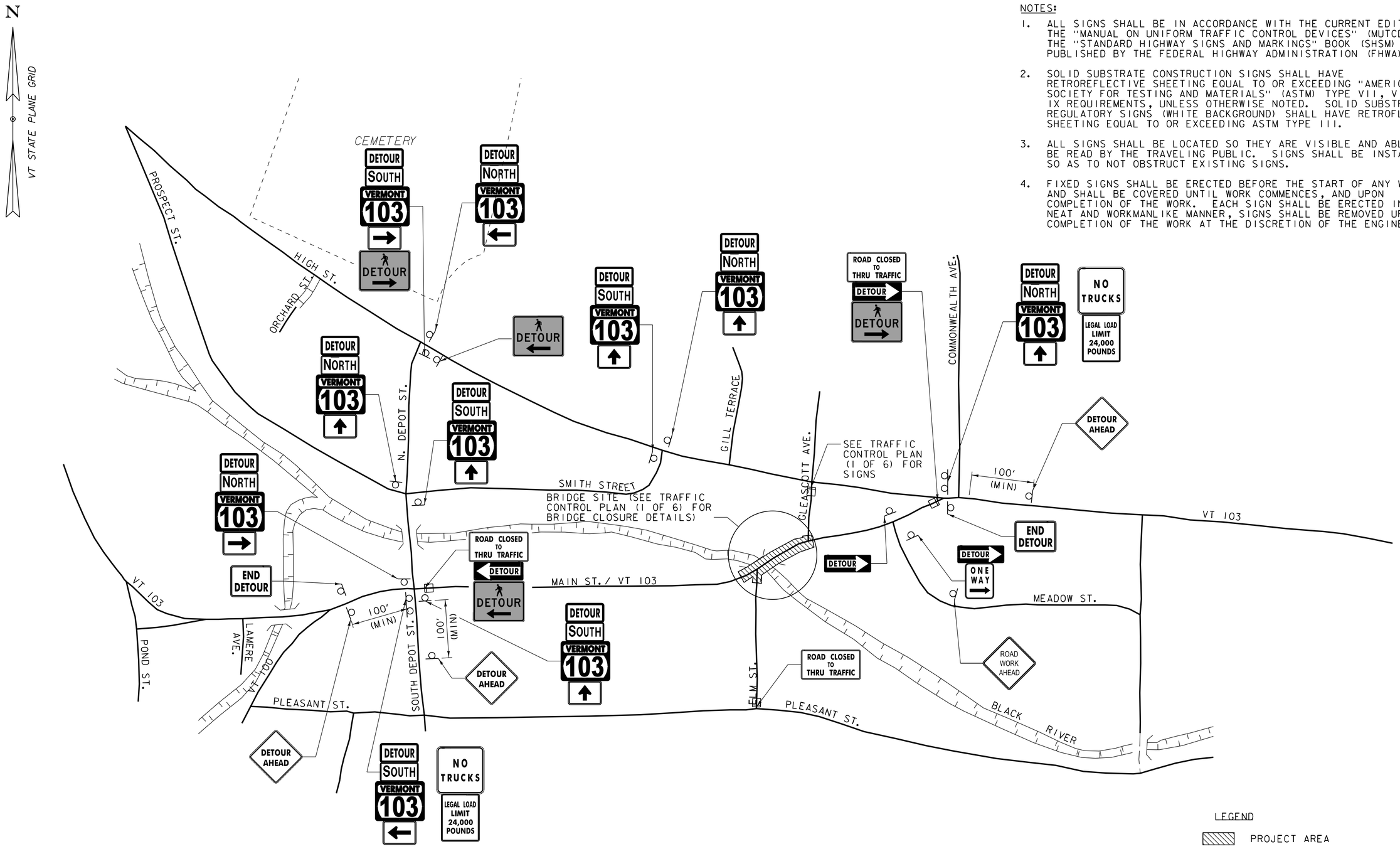
VHB 57435

N

VT STATE PLANE GRID

NOTES:

1. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
2. SOLID SUBSTRATE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) TYPE VII, VIII, OR IX REQUIREMENTS, UNLESS OTHERWISE NOTED. SOLID SUBSTRATE REGULATORY SIGNS (WHITE BACKGROUND) SHALL HAVE RETROFLECTIVE SHEETING EQUAL TO OR EXCEEDING ASTM TYPE III.
3. ALL SIGNS SHALL BE LOCATED SO THEY ARE VISIBLE AND ABLE TO BE READ BY THE TRAVELING PUBLIC. SIGNS SHALL BE INSTALLED SO AS TO NOT OBSTRUCT EXISTING SIGNS.
4. FIXED SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, AND UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER, SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.



LEGEND

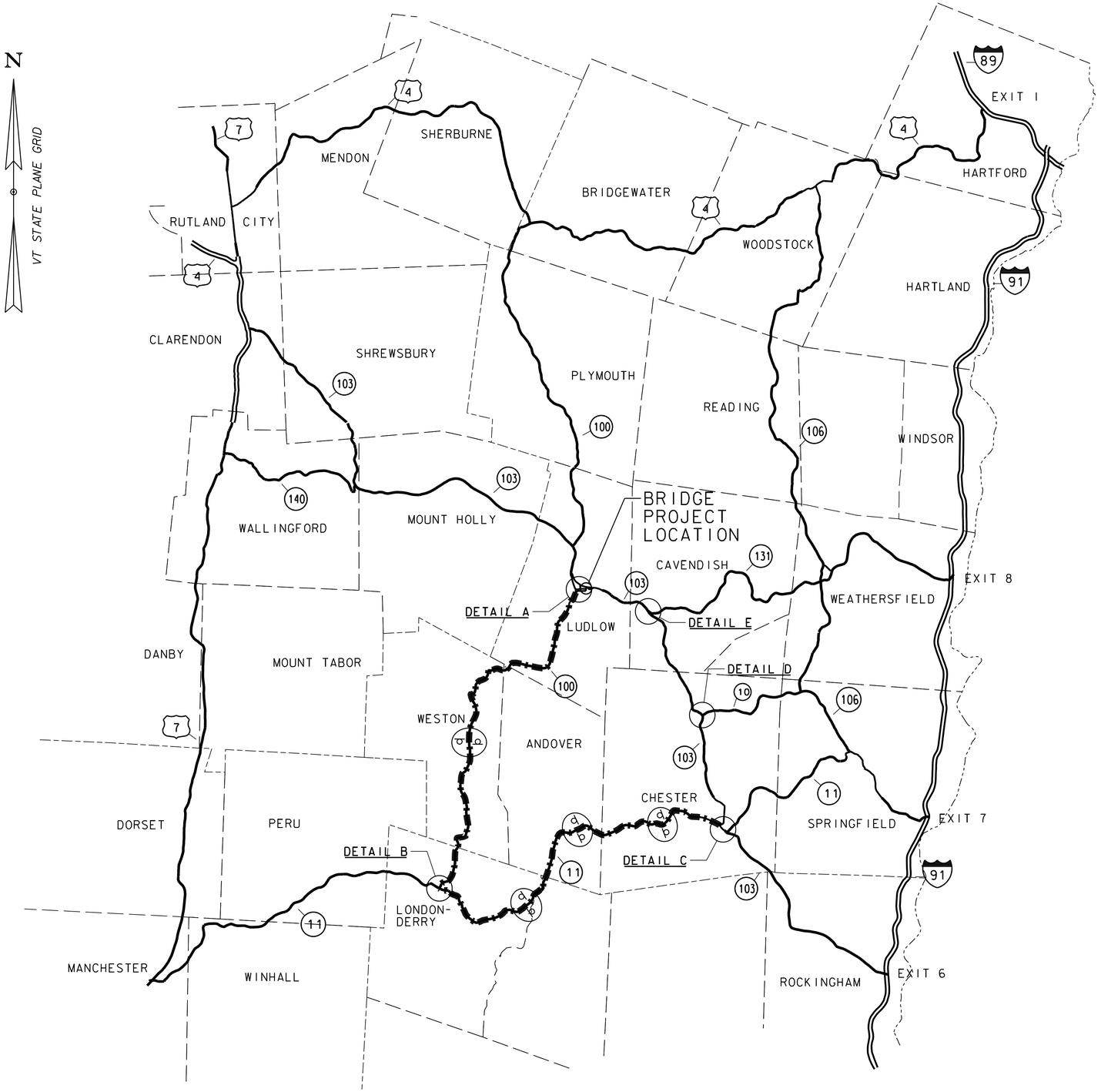
PROJECT AREA

TYPE III BARRICADE

LOCAL DETOUR
NOT TO SCALE

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068tcp2.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
TRAFFIC CONTROL PLAN (2 OF 6)	SHEET 18 OF 73

VHB 57435



REGIONAL TRAFFIC DETOUR

TRAFFIC CONTROL NOTES:

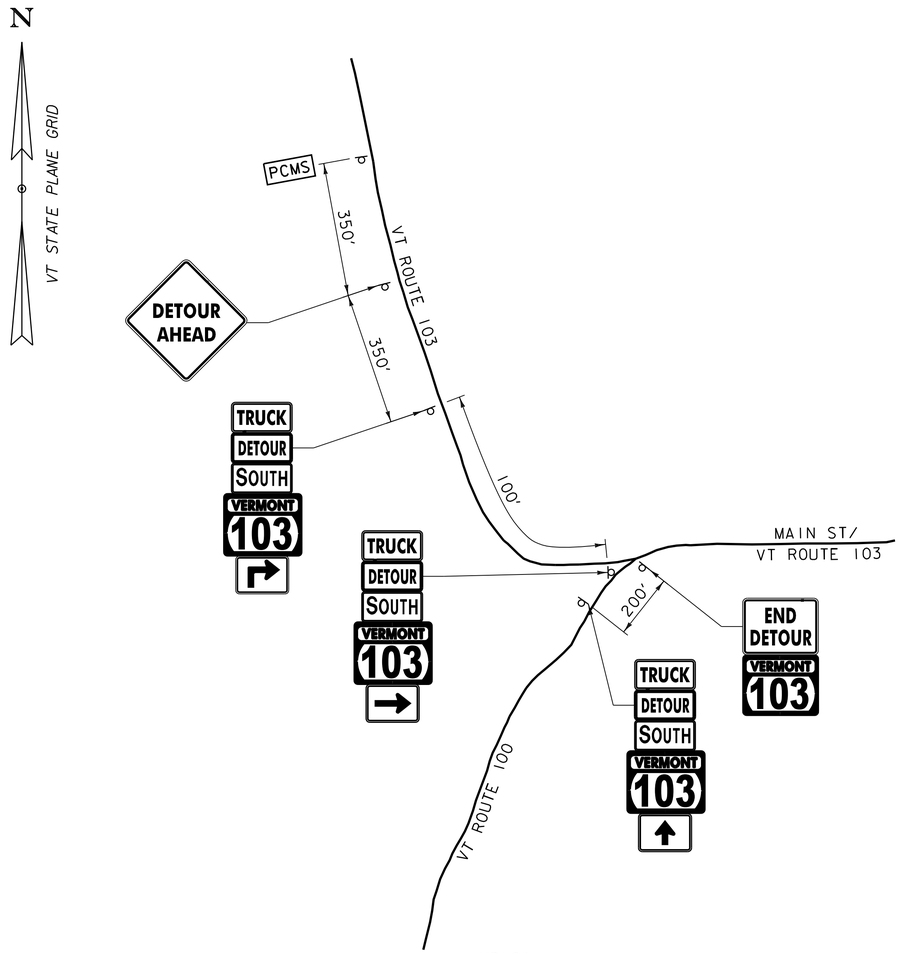
1. SEE TRAFFIC CONTROL PLAN 1, 2 AND 6 FOR ADDITIONAL NOTES.
2. INSTALL CONFIRMATORY ROUTE MARKERS ALONG THE DETOUR ROUTE AT LOCATIONS AS INDICATED ON THIS PLAN.
3. WHEN EXISTING ROUTE MARKER ASSEMBLIES ARE LOCATED AT THE INTERSECTIONS OR ALONG THE DETOUR ROUTE, THE DETOUR ROUTE MARKER ASSEMBLIES SHALL BE INSTALLED ADJACENT TO THE EXISTING ROUTE MARKER ASSEMBLIES AND THE ROUTE MARKER SHALL BE COVERED IF ASSEMBLY CONFLICTS WITH DETOUR ROUTE MARKER ASSEMBLY.
4. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST(S). WHEN ANCHORS ARE INSTALLED STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
5. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED OFF THE EDGE OF THE ROADWAY, OUTSIDE THE CLEAR ZONE, BUT SHALL BE VISIBLE FROM THE ROADWAY. ANY VEGETATION THAT INTERFERES WITH VISIBILITY OF THE PCMS SHALL BE REMOVED. REMOVAL OF THE VEGETATION SHALL BE INCIDENTAL TO ITEM 641.15, "PORTABLE CHANGEABLE MESSAGE SIGN". WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL.
6. THE PCMS SHALL BE USED IN ACCORDANCE WITH SECTION 6F.60 OF THE MUTCD.
7. SEE TRAFFIC CONTROL PLANS 4-5 FOR DETAILS A-E.

LEGEND

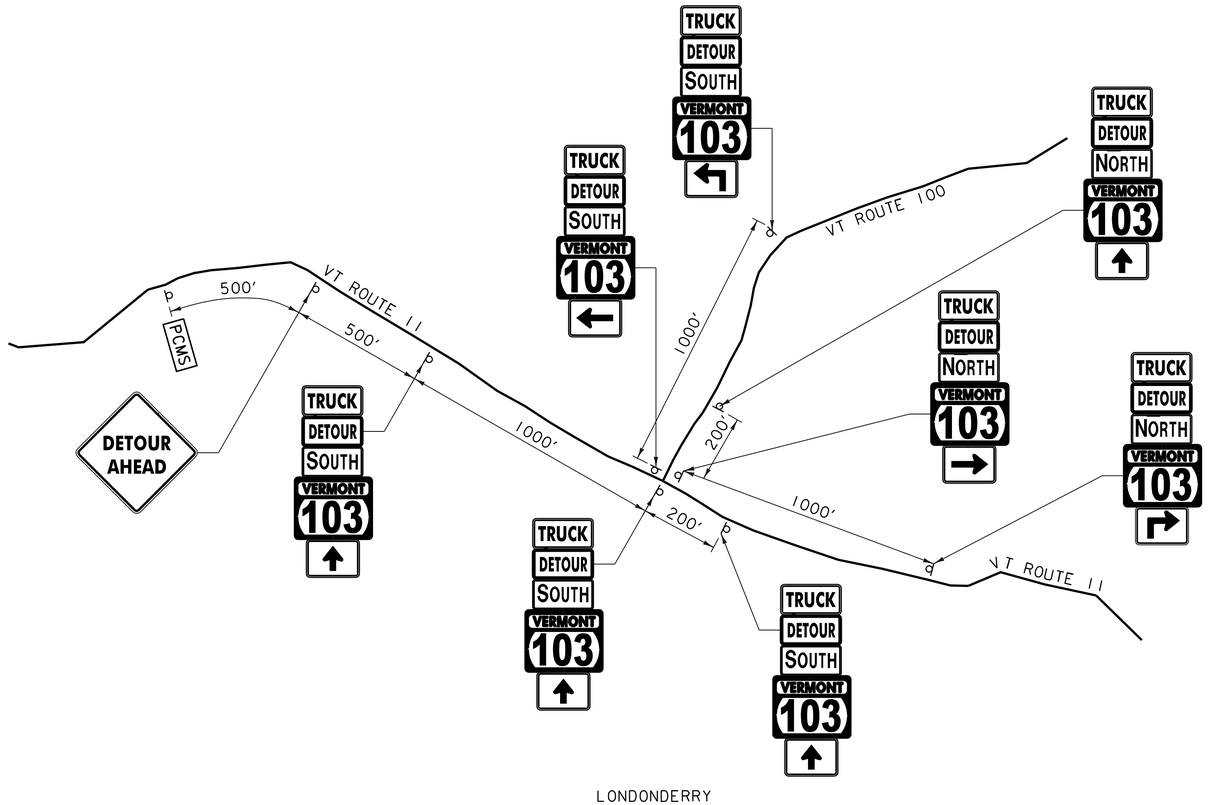
CONFIRMATORY ROUTE MARKER ASSEMBLY (SEE NOTE 2 AND 3 ABOVE)

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068detour.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: A. GUYETTE	CHECKED BY: A.P. GUYETTE
TRAFFIC CONTROL PLAN (3 OF 6)	SHEET 19 OF 73

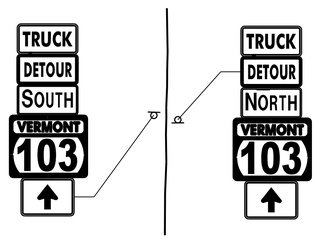
VHB 57435



DETAIL A
NOT TO SCALE



DETAIL B
NOT TO SCALE



CONFIRMATORY ROUTE MARKER ASSEMBLY
NOT TO SCALE

LEGEND

PCMS PORTABLE CHANGEABLE MESSAGE SIGN

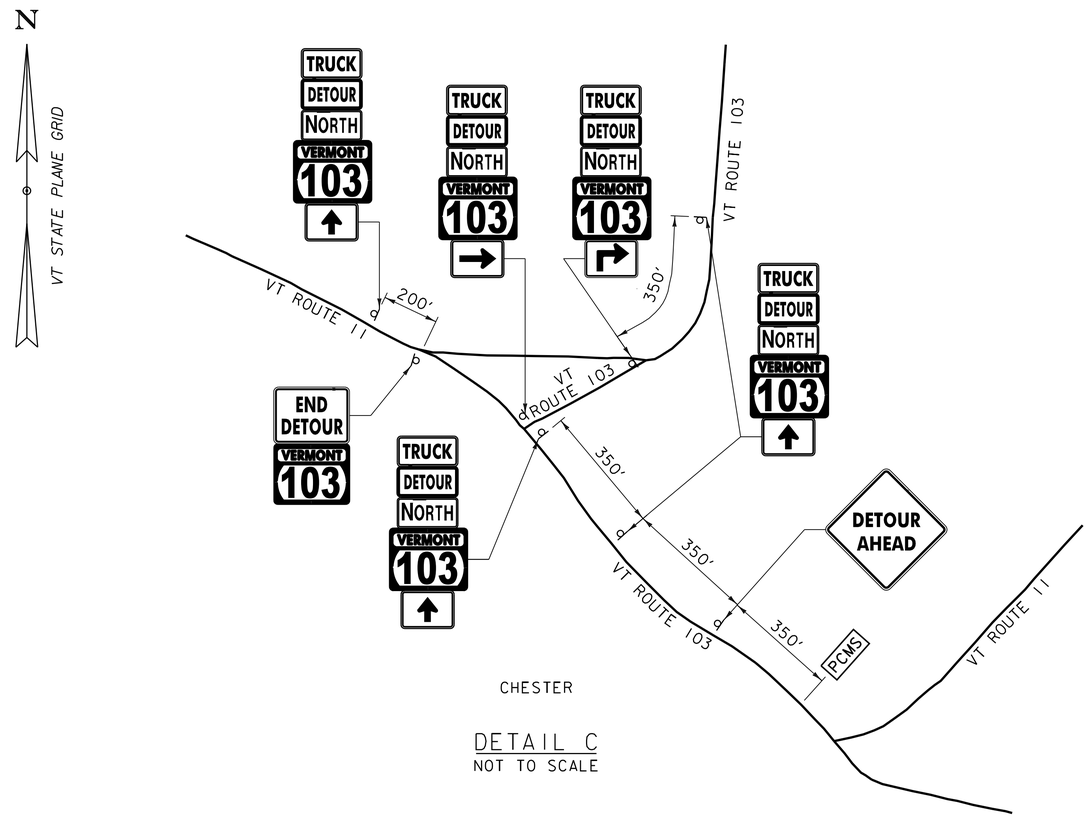
NOTE:

1. SEE TRAFFIC CONTROL PLAN (6 OF 6) FOR PCMS MESSAGES.
2. WHEN EXISTING ROUTE MARKER ASSEMBLIES ARE LOCATED AT THE INTERSECTIONS OR ALONG THE DETOUR ROUTE, THE DETOUR ROUTE MARKER ASSEMBLIES SHALL BE INSTALLED ADJACENT TO THE EXISTING ROUTE MARKER ASSEMBLIES.
3. ALL DISTANCES ARE APPROXIMATE AND MAY VARY IN THE FIELD.

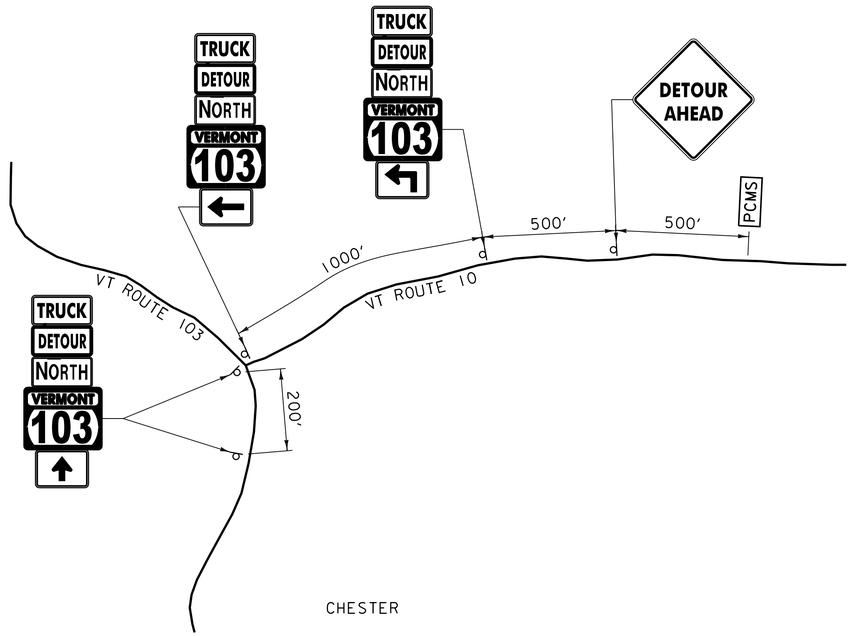
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)

FILE NAME: z10j068detour_dts.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
TRAFFIC CONTROL PLAN (4 OF 6)	SHEET 20 OF 73

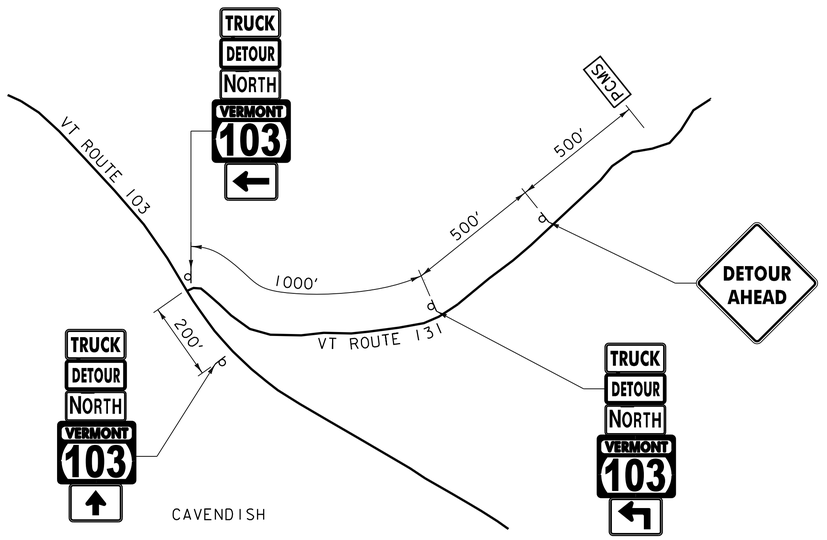
VHB 57435



DETAIL C
NOT TO SCALE



DETAIL D
NOT TO SCALE



DETAIL E
NOT TO SCALE

LEGEND

PCMS PORTABLE CHANGEABLE MESSAGE SIGN

NOTE:

1. SEE TRAFFIC CONTROL PLAN (6 OF 6) FOR PCMS MESSAGES.
2. WHEN EXISTING ROUTE MARKER ASSEMBLIES ARE LOCATED AT THE INTERSECTIONS OR ALONG THE DETOUR ROUTE, THE DETOUR ROUTE MARKER ASSEMBLIES SHALL BE INSTALLED ADJACENT TO THE EXISTING ROUTE MARKER ASSEMBLIES.
3. ALL DISTANCES ARE APPROXIMATE AND MAY VARY IN THE FIELD.

PROJECT NAME: LUDLOW	
PROJECT NUMBER: BRF 025-1(42)	
FILE NAME: z10j068detour_dts.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
TRAFFIC CONTROL PLAN (5 OF 6)	SHEET 21 OF 73

VHB 57435

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (IN)	SIZE OF SIGN HEIGHT (IN)	TEXT	NUMBER OF SIGNS REQ'D	REMARKS
M1-5	24	24	VERMONT 103	44*	SEE NOTE 6
M3-1	24	12	NORTH	25*	SEE NOTE 6
M3-3	24	12	SOUTH	17*	SEE NOTE 6
M4-4	24	12	TRUCK	32*	MOUNT ABOVE THE M3-1 OR M3-3
M4-8	24	12	DETOUR	42*	MOUNT ABOVE THE M3-1 OR M3-3
M4-8A	24	18	END DETOUR	4	MOUNT ON ONE POST
M4-9bL	30	24	DETOUR ←	2	MOUNT BELOW THE R11-4
M4-9bR	30	24	DETOUR →	4	MOUNT BELOW THE R11-4
M4-10L	48	18	← DETOUR	1	MOUNT BELOW THE R11-4
M4-10R	48	18	DETOUR →	3	MOUNT BELOW THE R11-4
M5-1L	21	15	↰	3	MOUNT BELOW THE M1-5
M5-1R	21	15	↱	3	MOUNT BELOW THE M1-5
M6-1L	21	15	←	5	MOUNT BELOW THE M1-5
M6-1R	21	15	→	5	MOUNT BELOW THE M1-5
M6-3	21	15	↑	26*	MOUNT BELOW THE M1-5
R5-1	30	30	DO NOT ENTER	1	MOUNT ON ONE POST
R5-2A	30	30	NO TRUCKS	2	MOUNT ON ONE POST

* = NUMBER OF SIGNS REQ'D ASSUMING APPROXIMATELY 4 LOCATIONS OF CONFIRMATORY ROUTE MARKER ASSEMBLY DETAIL

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (IN)	SIZE OF SIGN HEIGHT (IN)	TEXT	NUMBER OF SIGNS REQ'D	REMARKS
R6-2L	24	30	ONE WAY ←	1	MOUNT ON ONE POST
R6-2R	24	30	ONE WAY →	1	MOUNT ON ONE POST
R7-8M	12	18	RESERVED PARKING	1	MOUNT ON ONE POST
R9-3b	18	12	USE → CROSSWALK	1	MOUNT BELOW THE R9-9
R9-9	24	12	SIDEWALK CLOSED	2	MOUNT ON TYPE III (MOD) BARRICADE
R9-11	24	12	SIDEWALK CLOSED AHEAD ← CROSS HERE	1	MOUNT ON TYPE III (MOD) BARRICADE
R11-2	48	30	ROAD CLOSED	4	MOUNT ON TYPE III BARRICADE (MOD.)
R11-4	60	30	ROAD CLOSED TO THRU TRAFFIC	3	MOUNT ON TYPE III BARRICADE (MOD.)
VR_017	24	30	LEGAL LOAD LIMIT 24,000 POUNDS	2	MOUNT ON ONE POST
W20-1	48	48	ROAD WORK AHEAD	1	MOUNT ON TWO POSTS
W20-2	48	48	DETOUR AHEAD	8	MOUNT ON TWO POSTS
W20-3	48	48	ROAD CLOSED AHEAD	2	MOUNT ON TWO POSTS
W20-3	48	48	ROAD CLOSED 500 FT.	1	MOUNT ON TWO POSTS

NOTES:

1. THE COSTS OF ALL DETOUR SIGNS AND REQUIRED SIGN POSTS WILL BE INCLUDED IN ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".
2. COLORS FOR THE M1-5, M3-1, AND M3-3 SIGNS SHALL MATCH THE COLORS SHOWN ON VTRANS STD. E-136B.
3. COLORS FOR THE M5-1L, M5-1R, M5-2R, M6-1L, M6-1R, M6-2R AND THE M6-3 SIGNS SHALL BE A BLACK ARROW AND BORDER ON RETROREFLECTIVE ORANGE BACKGROUND.
4. COLORS FOR THE W20-2, M4-4 AND M4-8 SIGN SHALL BE BLACK TEXT AND BORDER ON RETROREFLECTIVE FLUORESCENT ORANGE BACKGROUND.
5. COLORS FOR THE R9-3b, R9-9, AND R9-11 SIGNS SHALL BE BLACK TEXT AND BORDER ON RETROREFLECTIVE WHITE BACKGROUND.
6. THE M1-5, M3-1, AND THE M3-3 SIGNS SHALL BECOME PROPERTY OF THE STATE AFTER THEY ARE REMOVED FROM THE DETOUR. THE CONTRACTOR SHALL DELIVER THE SIGNS TO THE STATE GARAGE IN THE TOWN OF LUDLOW. ALL COSTS ASSOCIATED WITH PROVIDING SIGNS TO THE STATE WILL BE CONSIDERED INCIDENTAL TO ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".
7. ONE WEEK PRIOR (7 DAYS) TO CONSTRUCTION ON THE BRIDGE, PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) MESSAGES 1 AND 2 WILL BE DISPLAYED AT THE BRIDGE AND PCMS MESSAGES 3, 4, AND 5 WILL BE DISPLAYED REGIONALLY.
8. DURING THE BRIDGE CLOSURE, PCMS SHALL READ MESSAGES 6, 7, AND 8 REGIONALLY.

MESSAGES FOR PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) - AT BRIDGE

ONE WEEK PRIOR

	MESSAGE 1	MESSAGE 2	
(ROUTE) ***	VT 103	MMMM DD	(DATE) **
	BRIDGE	TO	
	CLOSED	MMMM DD	(DATE) **

MESSAGES FOR PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) - REGIONAL DETOUR

ONE WEEK PRIOR

	MESSAGE 3	MESSAGE 4	MESSAGE 5	
(ROUTE) ***	VT 103	EAST OF	MMMM DD	(DATE) **
	BRIDGE	VT 100	TO	
	CLOSED	SOUTH	MMMM DD	(DATE) **

DURING BRIDGE CLOSURE

	MESSAGE 6	MESSAGE 7	MESSAGE 8
(ROUTE) ***	VT 103	EAST OF	NO
	BRIDGE	VT 100	THRU
	CLOSED	SOUTH	TRUCKS

** - MONTH SHALL BE SPELLED OUT - JUNE 10 NOT 06/10

*** - ROUTE VT 103 SHALL SPECIFY W (WEST) OR E (EAST) AS APPROPRIATE FOR THE DETOUR.

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068detour_dts.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.A. FIALA
TRAFFIC CONTROL PLAN (6 OF 6)

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 22 OF 73

VHB 57435

DUCTILE IRON PIPE, CEMENT LINED (8")
STA. 102+18 - STA. 102+33, RT
STA. 103+95 - STA. 104+34, RT

GATE VALVE WITH VALVE BOX (8")
STA. 102+17, RT
STA. 102+30, RT
STA. 104+01, RT

ADJUST ELEVATION OF VALVE BOX
STA. 104+34, RT
STA. 104+39, RT

SPECIAL PROVISION (WATER MAIN ON BRIDGE) (8")
STA. 102+33 - STA. 103+95, RT

JUNCTION BOX
STA. 102+34, 18.8' LT
STA. 102+60, 19.9' RT
STA. 103+57, 19.1' LT
STA. 103+82, 19.9' RT

LUMINAIRE & REMOVE AND RESET LIGHT POLE
STA. 102+35, LT
STA. 102+67, RT*
STA. 103+51, LT
STA. 103+82, RT

CHANGING ELEVATION OF SEWER MANHOLES
STA. 101+89, RT

WIRED CONDUIT (2") (PVC) & ELECTRICAL CONDUIT SLEEVE (6") (PVC)
STA. 102+34, LT - 102+60, RT
STA. 1+88, RT - 102+60, RT
STA. 102+60, RT - 102+82, RT (NO SLEEVE)
STA. 102+82, RT - 103+57, LT
STA. 102+82, RT (5')
STA. 103+51, LT - 103+57, LT

ELECTRICAL CONDUIT (4") (PVC)
STA. 102+34 - 102+57, LT (6 EA)
STA. 102+60 - 103+82, RT (6 EA)

NOTE: EXTEND BRIDGE CONDUIT INTO JUNCTION BOXES ON ALL CORNERS OF THE BRIDGE.

(1) STA. 101+21.8, 17.0' LT
CHANGING ELEVATION OF DROP INLET
NEW RIM = 992.60

(2) STA. 101+21.8, 17.0' LT - STA. 101+27.4, 20.9' RT
REMOVE EXISTING 12" PVC PIPE

(3) STA. 101+21.8, 17.0' LT - STA. 101+29.8, 18.5' RT
37' x 18" CPEP (SL)
18" INV. @ INLET (1) = 988.97
18" INV. @ OUTLET (5) = 988.51

(4) STA. 101+27.4, 20.9' RT
REMOVE EXISTING DROP INLET

(5) STA. 101+29.8, 18.5' RT
NEW PRECAST REINFORCED CONCRETE
DROP INLET WITH CAST IRON GRATE, TYPE D
RIM = 992.47

(6) STA. 101+27.4, 20.9' RT - STA. 101+34.0, 22.0' RT
REMOVE EXISTING 12" PVC PIPE

(7) STA. 101+29.9, 18.5' RT - STA. 101+34.6, 18.5' RT
5' x 18" CPEP (SL)
18" INV. @ INLET (5) = FIELD VERIFY
18" INV. @ OUTLET (EXISTING 48" CGMP) = FIELD VERIFY

(8) STA. 103+81.8, 39.4' RT - STA. 104+01.6, 14.8' RT
REMOVE EXISTING 18" PVC PIPE
32' x 18" CPEP (SL)
18" INV. @ INLET (7) = 993.11
18" INV. @ OUTLET (39.4' RT) = 991.87

(9) STA. 104+01.6, 14.8' RT
NEW PRECAST REINFORCED CONCRETE
DROP INLET WITH CAST IRON GRATE, TYPE D
RIM = 998.28

(10) STA. 103+82.1, 14.8' LT - STA. 104+01.6, 14.8' RT
34' x 18" CPEP (SL)
18" INV. @ INLET (9) = 993.90
18" INV. @ OUTLET (7) = 993.21

(11) STA. 103+82.1, 14.8' LT
NEW PRECAST REINFORCED CONCRETE
DROP INLET WITH CAST IRON GRATE, TYPE D
RIM = 997.88

(12) STA. 104+05.9, 8.80' RT
REMOVE EXISTING DROP INLET

(13) STA. 103+81.8, 39.4' RT - STA. 104+05.9, 8.8' RT
REMOVE EXISTING 18" PVC PIPE

(14) STA. 104+05.9, 8.8' RT - STA. 105+19.6, 16.7' RT
REMOVE EXISTING 18" PVC PIPE

(15) STA. 104+01.6, 14.8' RT - STA. 105+19.6, 16.7' RT
117' x 18" CPEP (SL)
18" INV. @ INLET (14) = 994.43
18" INV. @ OUTLET (7) = 993.21

(16) STA. 105+19.6, 16.7' RT
CHANGING ELEVATION OF DROP INLET
NEW RIM = 1000.49

(17) STA. 103+38.6, 17.3' RT - 103+47.8, 14.0' RT
REMOVE EXISTING 8" PVC PIPE

* - POLE IS NOT INSTALLED BUT IS PROPERTY OF THE TOWN. CONTRACTOR TO COORDINATE WITH THE TOWN AND USE TOWN'S POLE AT THIS LOCATION.

PROJECT NAME: LUDLOW	
PROJECT NUMBER: BRF 025-1(42)	
FILE NAME: z10j068bdr_utility_reloc.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: R.H. BARNES	CHECKED BY: A.P. GUYETTE
UTILITY LAYOUT SHEET	SHEET 23 OF 73

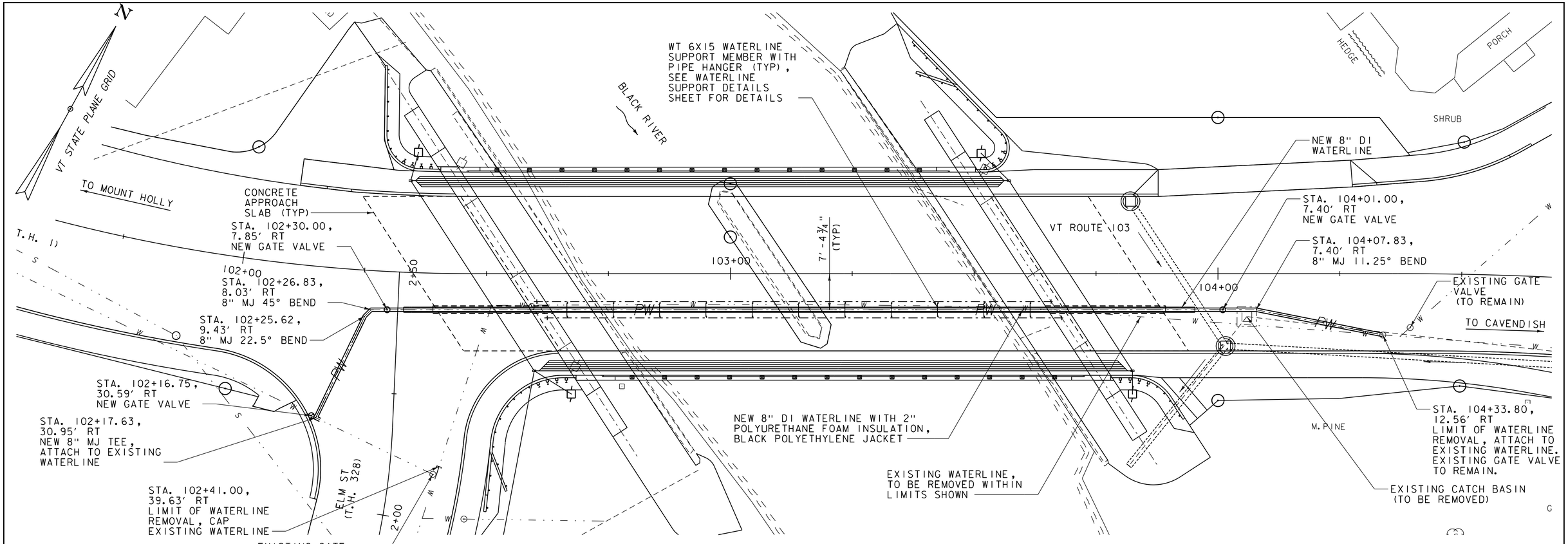
STATE OF VERMONT
AGENCY OF TRANSPORTATION

DRAINAGE DETAIL SHEET

STATION	STATION	POS.	ASKEW	INLET/OUTLET TYPE		DITCH		PIPE ARCH			PIPE		ALLOWABLE OPTIONS						PIPE ELBOW	ES	CB	PRCCDI	DEPTH DI	CONC CLASS B	REINF STEEL	DI GRATE	CHAN ELEV	CRM	TRENCH EXCAVATION		COMM EXC	UNC CHAN EXC	STRUCT EXCAV	GRAN BKFILL STRUCT	GRAN BORR	EROS MATT	STONE FILL		MARKER POSTS			FLAG	REMARKS
				INLET	OUTLET	IN	OUT	SPAN	RISE	L	D	L	PCCSP	CAAP	RCP	CSP	CPEP	PCCSP PI										EARTH	ROCK									LT	RT		
			NO. DEG.					IN	IN	FT	IN	FT	TH	TH	CL	TH	SL	TH	NO. DEG.	EA	EA		FT	CY	LBS	TYPE	EA	CY	CY	CY	CY	CY	CY	CY	SY	CY	TYPE	EA	EA		
101+22		LT																								1		0					0							1	CHANGE ELEVATION OF DROP INLET
101+22	101+22	LT-RT		DI	DI																							11.5					12.5							2	REMOVE EXISTING 12" PVC PIPE
101+22	101+30	LT-RT		DI	DI						18	37					X											14.0					12.0							3	NEW 18" CPEP(SL) PIPE
101+27		RT																										5	2.0				6.0							4	REMOVE EXISTING DI
101+30		RT																				X	5.2			D		7.5					3.5							5	NEW PRECAST DI
10+27	101+34	RT		DI	CGMP																							2.0					2.0							6	REMOVE EXISTING 12" PVC PIPE
101+30	101+35	RT		DI	CGMP						18	5					X											2.5					2.0							7	NEW 18" CPEP(SL) PIPE CONNECTING INTO EXISTING 48" CGMP
103+82	104+02	RT		DI	RIVER						18	32					X											0					2.0							8	REMOVE EXIST. 18" PVC PIPE, NEW 18" CPEP(SL) PIPE
104+02		RT																				X	6.2			D		6					3.5							9	NEW PRECAST DI
103+82	104+02	LT-RT		DI	DI						18	34					X											9.5					7.5							10	NEW 18" CPEP(SL) PIPE
103+82		LT																				X	5.0			D		18					3.5							11	NEW PRECAST DI
104+06		RT																										4	2.0				4.5							12	REMOVE EXISTING DI
103+82	104+06	RT		DI	DI																							8.5					11.0							13	REMOVE EXISTING 18" PVC PIPE
104+06	105+20	RT		DI	DI																							54.5					61.0							14	REMOVE EXISTING 18" PVC PIPE
104+02	105+20	RT		DI	DI						18	117					X											63.5					56.0							15	NEW 18" CPEP(SL) PIPE
105+20		RT																								1		0					0							16	CHANGE ELEVATION OF DROP INLET
103+39	103+50	RT																										0	0				0							17	REMOVE 8" PVC PIPE OVER EXIST. ABUTMENT NO. 2

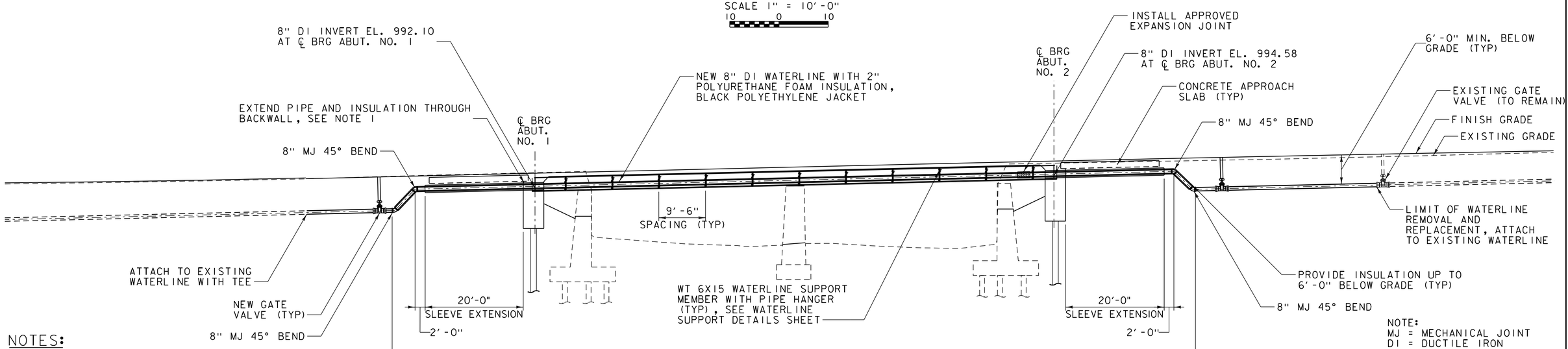
PROJECT NAME:	**LUDLOW**
PROJECT NUMBER:	**BRF 025-1(42)**
FILE NAME:	**z10j068dds.dgn**
PROJECT LEADER:	**A.P. GUYETTE**
DESIGNED BY:	**R.H. BARNES**
DRAINAGE DETAIL SHEET #1	
PLOT DATE:	**8/22/2016**
DRAWN BY:	**R.H. BARNES**
CHECKED BY:	**A.P. GUYETTE**
SHEET 24	OF 73

VHB 57435



WATERLINE - PLAN

SCALE 1" = 10'-0"



WATERLINE - ELEVATION

SCALE 1" = 10'-0"

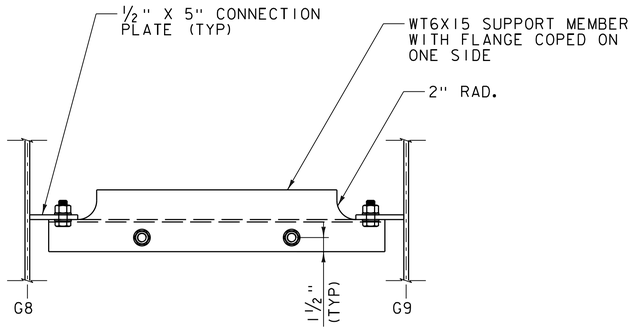
NOTE:
MJ = MECHANICAL JOINT
DI = DUCTILE IRON

NOTES:

1. PIPE, INSULATION, AND JACKET SHALL BE EXTENDED THROUGH BACKWALL AND UNDERNEATH THE APPROACH SLAB WITH 18" SLEEVE. A LINK-SEAL SHALL BE PROVIDED BETWEEN THE PIPE AND SLEEVE AT EXPOSED FACE OF ABUTMENT. PIPE SUPPORTS SHALL BE PROVIDED IN SLEEVE AND THE END OF SLEEVE SHALL BE SEALED.
2. PROVIDE THRUST BLOCKS AT ALL BENDS IN THE WATERLINE, 22.5 DEGREES AND GREATER, SEE WATERLINE NOTES AND DETAILS SHEET.

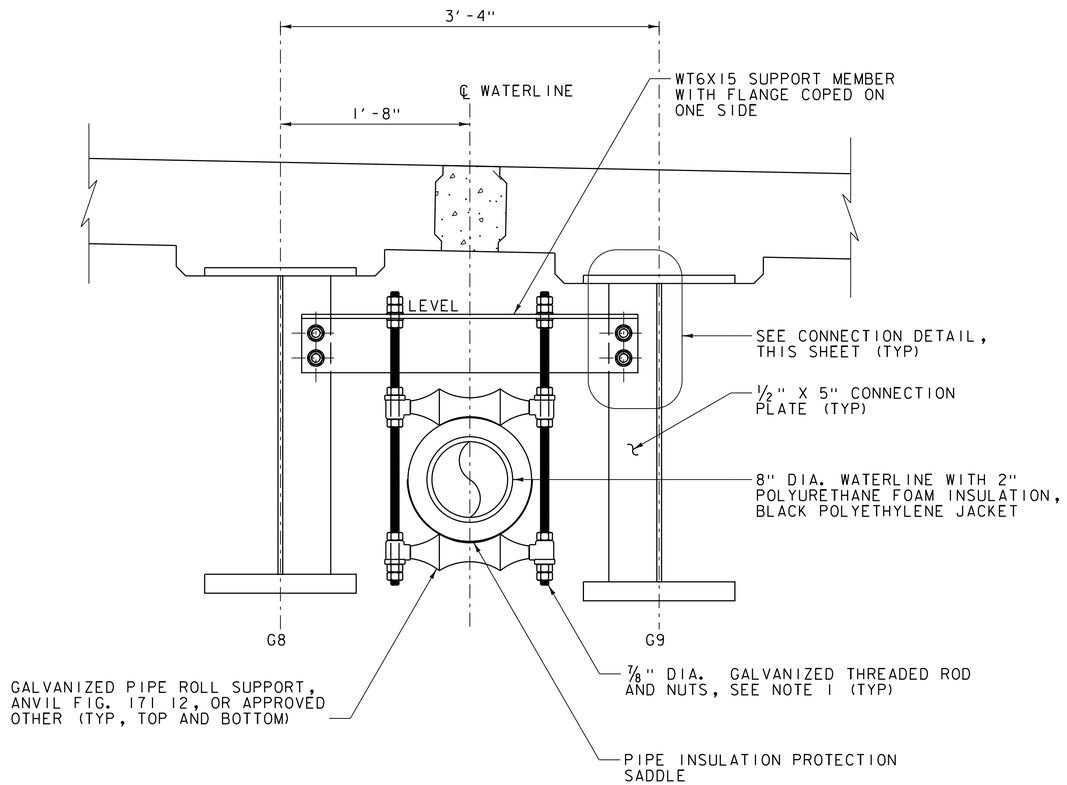
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068watpe.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: R.H. BARNES
DESIGNED BY: R.H. BARNES	CHECKED BY: A.P. GUYETTE
WATERLINE PLAN AND ELEVATION	SHEET 25 OF 73

VHB 57435



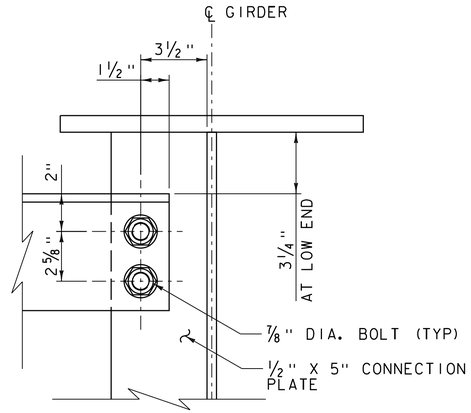
WATERLINE SUPPORT PLAN

SCALE: 1½" = 1'-0"



WATERLINE SUPPORT SECTION

SCALE: 1½" = 1'-0"



CONNECTION DETAIL

SCALE: 3" = 1'-0"

NOTES:

1. TOP AND BOTTOM NUTS SHALL BE DOUBLE NUTTED AS SHOWN.
2. WASHERS SHALL BE INSTALLED BETWEEN NUTS AND SUPPORT BEAM.
3. CONTRACTOR SHALL SET WATERLINE SO AS TO AVOID CONFLICT BETWEEN PIPE SUPPORTS AND JOINT ASSEMBLIES.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

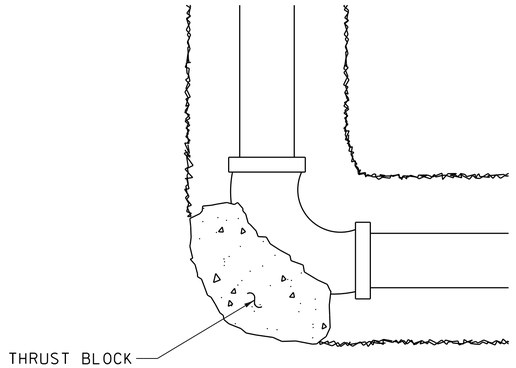
FILE NAME: z10j068wat.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: R.H. BARNES
WATERLINE SUPPORT DETAILS

PLOT DATE: 8/23/2016
DRAWN BY: R.H. BARNES
CHECKED BY: A.P. GUYETTE
SHEET 26 OF 73

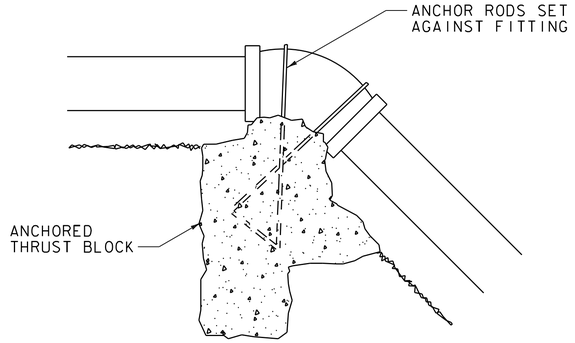
VHB 57435

WATERLINE NOTES:

1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2011, AND ITS LATEST REVISIONS.
2. EXISTING UTILITIES ARE APPROXIMATE ONLY AND MAY NOT BE COMPLETE. THE CONTRACTOR SHALL VERIFY ALL UTLITY LOCATIONS AND IDENTIFY ANY CONFLICTS PRIOR TO PLACEMENT OF THE PIPE. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES. THE CONTRACTOR SHALL CONTACT "DIG SAFE" AT 811, PRIOR TO ANY CONSTRUCTION.
3. THE CONTRACTOR SHALL COORDINATE WITH THE TOWN OF LUDLOW FOR ALL WATERLINE EXCAVATIONS AND WATERLINE WORK.
4. THE WATERLINE WILL BE DEACTIVATED WITHIN THE LIMITS OF WORK DURING CONSTRUCTION AND A TEMPORARY WATERLINE IS NOT REQUIRED.
5. TESTING SHALL INCLUDE BUT NOT BE LIMITED TO CHLORINATION AND PRESSURE TESTING OF THE NEW SEGMENT OF WATERLINE PRIOR TO FINAL CONNECTION OF THE SYSTEM. TESTING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
6. PROVIDE RESTRAINED JOINTS AND CONCRETE THRUST BLOCKS AT ALL BENDS IN THE WATERLINE, 22.5 DEGREES AND GREATER. REFER TO THRUST BLOCK REQUIREMENTS. IN LOCATIONS WHERE THE THRUST IS VERTICALLY UPWARD, THE THRUST BLOCK SHALL BE ANCHORED TO THE FITTING WITH ANCHOR RODS OR APPROVED OTHER. PLACE POLYETHYLENE SHEETING BETWEEN ALL CONCRETE THRUST BLOCKS AND FITTINGS TO PREVENT BOND.



90°, 45°, OR 22.5° BEND



UPWARD THRUST

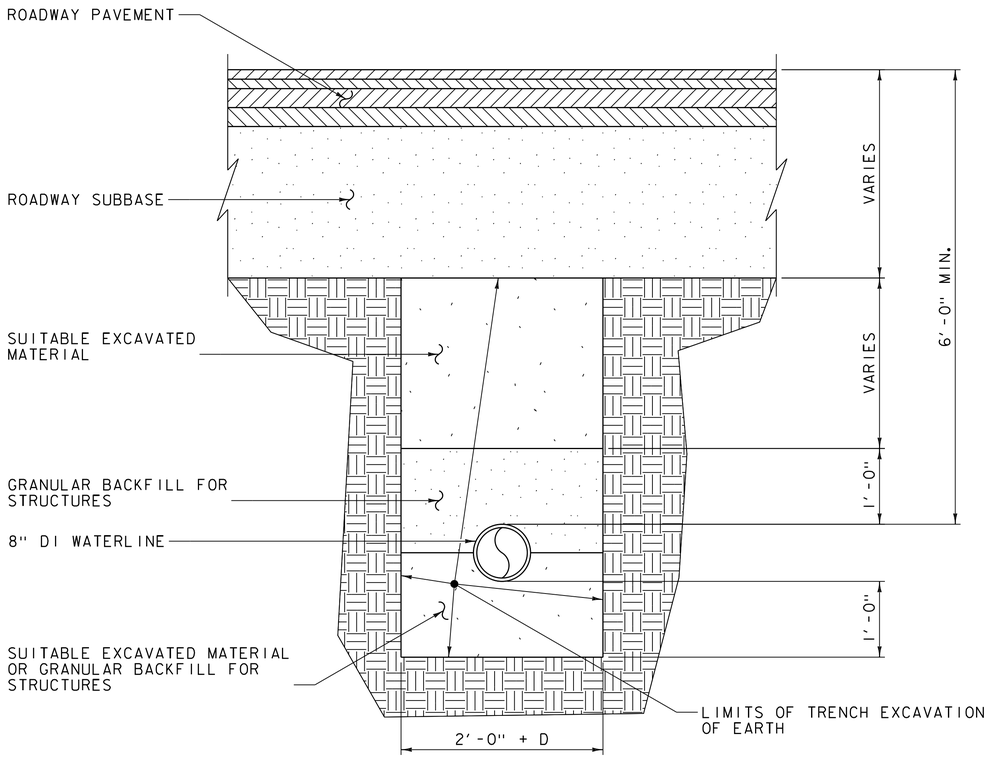
THRUST BLOCK DETAILS

NOT TO SCALE

	SOFT WET CLAY, SAND OR SILT (1000 PSF)	DRY SAND (3000 PSF)	COMPACT SAND, COARSE GRAVEL OR HARDPAN (5000 PSF)
CAP OR TEE	20 SF	7 SF	4 SF
90° BEND	27 SF	9 SF	6 SF
45° BEND	15 SF	5 SF	3 SF
22.5° BEND	8 SF	3 SF	2 SF

AREA OF BEARING ON FACE OF CONCRETE THRUST BLOCKS

(IN SQUARE FEET)

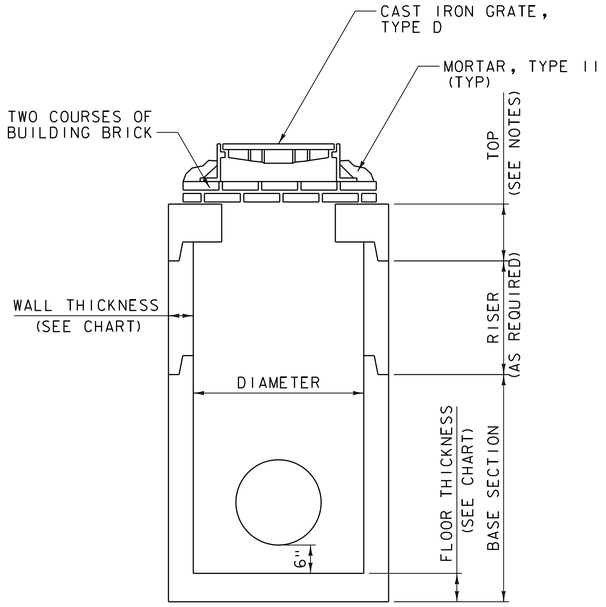


WATERLINE TRENCH DETAIL

NOT TO SCALE

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068wat.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: R.H. BARNES
DESIGNED BY: R.H. BARNES	CHECKED BY: A.P. GUYETTE
WATERLINE NOTES AND DETAILS	SHEET 27 OF 73

VHB 57435



PRECAST REINFORCED CONCRETE DROP INLET

NOT TO SCALE

DROP INLET NOTES:

1. ALL PRECAST CONCRETE DROP INLETS SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH SUBSECTION 705.04.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL INVERT ELEVATIONS, PIPE SIZES AND LOCATIONS SHOWN PRIOR TO ORDERING PRECAST COMPONENTS.
3. SEE STANDARD D-15 FOR CAST IRON FRAME AND GRATE DETAILS.
4. THE TOP SECTIONS MAY BE EITHER THE FLAT TOPS AS SHOWN OR CONE SECTIONS. IF CONE SECTIONS ARE USED THEY MAY EITHER BE CONCENTRIC OR ECCENTRIC. PIPES ARE NOT TO ENTER CONE SECTIONS.
5. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN ANGLE OF 11° CENTERED IN THE WIDTH OF THE JOINT. ALL SECTIONS SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT.
6. ALL SECTIONS WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 1'-0" OF OUTSIDE SURFACE BETWEEN HOLES. NO MORE THAN 75% OF A HORIZONTAL CROSS SECTION SHALL BE HOLES. HOLES SHALL BE NO CLOSER THAN 3" TO A JOINT.

SIZING CHART

DIAMETER	WALL THICKNESS	FLOOR THICKNESS
4'-0" OR SMALLER	5¼"	6"
5'-0"	6"	8"
6'-0"	7"	8"

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068wat.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: R.H. BARNES
DRAINAGE NOTES AND DETAILS

PLOT DATE: 8/23/2016
DRAWN BY: R.H. BARNES
CHECKED BY: A.P. GUYETTE
SHEET 28 OF 73

VHB 57435

N

VT STATE PLANE GRID

SPECIAL PROVISION (DURABLE CROSSWALK MARKING, IMPRINTED/COLORIZED)
STA. 102+09 - 102+15, LT & RT
STA. 2+24 - 2+29, LT & RT
STA. 5+22 - 5+28, LT & RT

DETECTABLE WARNING SURFACE
STA. 102+12, LT & RT
STA. 102+52, RT
STA. 104+67, LT

ERECTING SALVAGED SIGNS
STA. 102+56, RT

REMOVING SIGNS
STA. 102+01, RT (2)
STA. 102+47, LT (2)
STA. 102+61, RT (3)
STA. 102+78, RT
STA. 103+40, LT

TRAFFIC SIGN, TYPE A
STA. 102+00, RT (2)
STA. 102+32, LT (2)
STA. 102+56, RT (2)
STA. 102+69, RT
STA. 103+50, LT
STA. 104+91, LT

LETTER OR SYMBOL
STA. 102+37, RT
STA. 105+12, LT

24 INCH STOP BAR
STA. 102+32 - 102+47, RT
STA. 104+92 - 105+17, LT

12 INCH WHITE LINE
STA. 102+09, LT & RT
STA. 102+16, LT & RT
STA. 2+23, LT & RT
STA. 2+30, LT & RT
STA. 5+22, LT & RT
STA. 5+30, LT & RT

4 INCH YELLOW LINE
STA. 100+75 - 102+08, LT & RT
STA. 102+52 - 104+80, LT & RT
STA. 105+33 - 105+75, LT & RT
STA. 1+50 - 2+21, LT & RT
STA. 5+36 - 5+86, LT & RT

4 INCH WHITE LINE
STA. 100+75 - 104+87, LT
STA. 100+75 - 102+08, RT
STA. 102+16 - 12+19, RT
STA. 102+46 - 105+75, RT
STA. 105+31 - 105+75, LT
STA. 1+50 - 2+23, LT & RT
STA. 5+27 - 5+50, LT
STA. 5+34 - 5+50, RT

STA. 102+32, LT
W11-2 N
W16-7P N
N

VD-701
BRIDGE NO. 25 VT 103 R
R

R W11-2
R W16-7
R

STA. 103+50, LT
VD-701
BRIDGE NO. 25 VT 103 N
N

3'-4"
3" 1'-0" 6" 3"
Gleascott Ave

BLACK RIVER

TO MOUNT HOLLY

100+00

BEGIN PROJECT
STA. 101+52.50

101+00

VT ROUTE 103 (T.H. 1)

SWL

5'-6" DYL (TYP)

SWL

102+00

2+50

R & S TRAFFIC MIRROR

END PROJECT
STA. 104+37.50

END BRIDGE
STA. 103+63.67
F.G. 997.76

103+00

104+00

105+00

5+00

SWL

DYL

TO CAVENDISH

106+00

END APPROACH
STA. 5+50.00

GLEASCOTT AVE (T.H. 314)

6+00

STOP

BEGIN APPROACH
STA. 100+75.00

STA. 102+00, RT
W11-2 N
W16-7 N
N

BEGIN BRIDGE
STA. 102+54.99
F.G. 995.21

W11-2 R
W16-7 R
R

2+00

SWL

SEE TRAFFIC SIGN SUMMARY SHEET FOR ITEM 900.640, "SPECIAL PROVISION (DURABLE CROSSWALK MARKING, IMPRINTED/COLORIZED)" DETAILS

STA. 104+91, LT
Gleascott Ave N
STOP RET
R1-1
RET

STA. 102+69, RT
VD-701
BRIDGE NO. 25 VT 103 N
N

VD-701
BRIDGE NO. 25 VT 103 R
R

ELM ST.
1+00 (T.H. 328)

BEGIN APPROACH
STA. 1+50.00

STA. 102+56, RT
Elm St N
STOP N
R1-1
1030 1410 0195 S
VD-700
N

ELM ST R
STOP R
R1-1
1030 1410 0195 R & S
VD-700
R

3" 2'-0" 1'-0" 6" 3"
Elm St

SIGNING LEGEND
N = NEW
RET = RETAIN
R = REMOVE
S = SALVAGE

STRIPING LEGEND
DYL = DOUBLE YELLOW LINE
SWL = SINGLE WHITE LINE

0 20 40
SCALE IN FEET

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

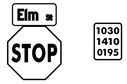
FILE NAME: z101068tsl.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.A. FIALA
TRAFFIC SIGNS AND LINE STRIPING

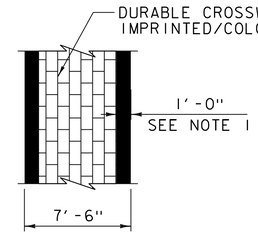
PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 29 OF 73

VHB 57435

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILE MARKER, STATION, OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS EA	WIDTH (IN)	HEIGHT (IN)	NEW & SALVAGED SIGNS "A"	"B"	SALV SIGN	SALV TIS	EXIST POST RETAIN	EXIST POST SALVAGE	NEW SIGN POSTS NO. OF POSTS	FLANGED CHANNEL LB/FT 1.12	2.0	3.0	SQUARE STEEL (IN) LB/FT 1.75 1.88	2.0 2.42	2.5 3.35	ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (IN) LB/FT 3.0 1.3	4.0 1.7	4.0 MOD 1.7	FOUNDATION	TUBULAR STEEL Ø (IN) LB/FT 3.0 7.6	3.5 9.0	4.0 10.8	5.0 14.6	W-SHAPE STEEL FTG. SIZE 24"	30"	WEIGHT	POST SIZE	SIGN FRAME REQUIRED	REMARKS	SIGN DETAIL DETAIL ON SHEET NUMBER	STD. SHEET NUMBER
											OPTION ITEMS																									
VT 103																																			
102+00, RT 102+32, LT		2	30	30	12.5						2					X		X															WI1-2: SIGN BACKGROUND SHALL BE FLUORESCENT YELLOW GREEN		SHSM
		2	24	12	4.00																											WI6-7: SIGN BACKGROUND SHALL BE FLUORESCENT YELLOW GREEN		SHSM
102+56, RT		1	24	12	2.00						1					X		X															STREET SIGN SHALL HAVE GREEN BACKGROUND WITH WHITE LETTERING	29	
		1	6	10			0.42																									VD-700		T-44
		1	30	30	6.25																											RI-1		SHSM
102+69, RT 103+50, LT		2	6	8	0.67						2				X			X															VD-701		T-42
104+91, LT		1	40	12	3.33						0																					STREET SIGN SHALL HAVE GREEN BACKGROUND WITH WHITE LETTERING	29	
AVERAGE POST LENGTH = 15 FEET FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE VTRANS "SIGN POST DESIGN GUIDELINE."												FT	FT	FT	FT 30	FT 45	FT		EA	LB	LB	LB		LB	LB	LB	LB								
	TOTALS				SF 28.75	SF	EA. 1	SF				FT			FT 75					LB			EA.	LB				EA.	EA.	LB					



DETAIL OF ITEM 900.640, "SPECIAL PROVISION (DURABLE CROSSWALK MARKING, IMPRINTED/COLORIZED)

NOT TO SCALE

NOTES:

1. PERMANENT CROSSWALKS SHALL HAVE A DURABLE 12 INCH WIDE THERMOPLASTIC WHITE LINE PLACED ON THE OUTSIDE EDGES OF THE INLAID BRICK PATTERN WILL BE CONSIDERED INCIDENTAL TO PAY ITEM 900.640, "SPECIAL PROVISION (DURABLE CROSSWALK MARKING, IMPRINTED/COLORIZED)".
2. THE PER FOOT COST OF INSTALLED PERMANENT CROSSWALK MARKINGS WILL BE PAID FOR AS ITEM 900.640, "SPECIAL PROVISION (DURABLE CROSSWALK MARKING, IMPRINTED/COLORIZED)".

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068tss.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
TRAFFIC SIGN SUMMARY SHEET	SHEET 30 OF 73

VHB 57435

SOIL CLASSIFICATION

AASHTO	
A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▼	Water Elevation
⊗	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler 1 3/8" I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 5/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	Top of Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
ROD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)
VTSPG	NAD83 - See Note 7

COLOR			
blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

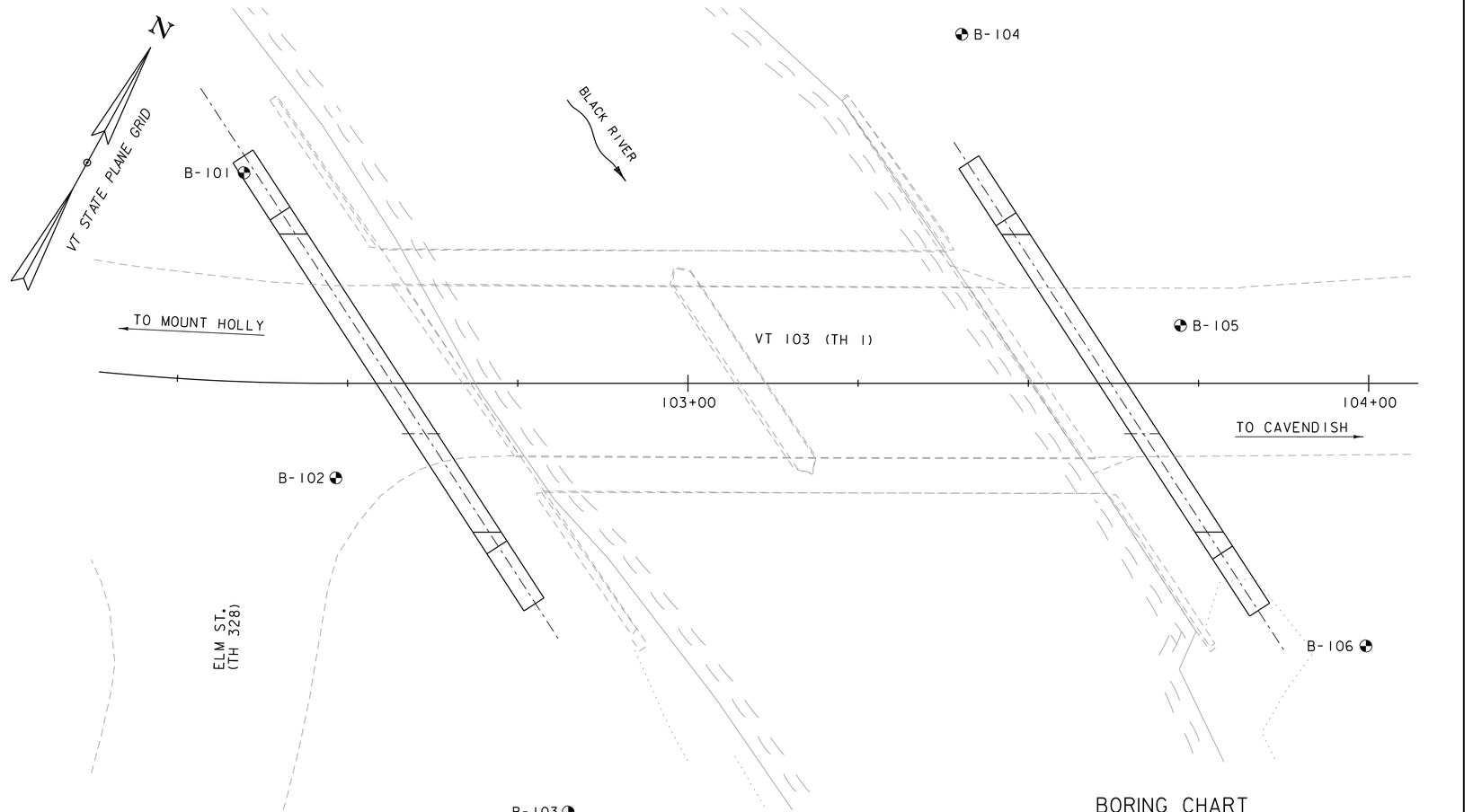
MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.



BORING LAYOUT

SCALE 1" = 10'-0"
10 0 10

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
B-101	VT 103 (TH 1) 102+33.54	30.7 LT	994.0	----
B-102	VT 103 (TH 1) 102+48.28	13.9 RT	994.0	930.0
B-103	VT 103 (TH1) 102+82.42	63.0 RT	992.0	----
B-104	VT 103 (TH1) 103+40.22	51.3 LT	998.0	----
B-105	VT 103 (TH1) 103+72.35	8.5 LT	997.0	942.0
B-106	VT 103 (TH1) 103+99.60	38.6 RT	998.0	----

GENERAL NOTES

1. The subsurface explorations shown herein were made between in January, 2012 by Geosearch, Inc.
2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by Mikes Coring and Boring and the Agency, and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
4. Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.
5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.
7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in survey feet.

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z101068bor.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: B.M. KLINEFELTER
BORING INFORMATION SHEET

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 31 OF 73

VHB 57435

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-101**
Page No.: 1 of 1
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/26/12 Date Finished: 1/27/12
VTSPG NAD83: N 326718.81 ft E 1588076.53 ft
Station: 102+33.54 Offset: 30.7 LT
Ground Elevation: 994.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
01/26/12	7.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt, 0.0 ft - 0.3 ft					
		A-2-4, SiGrSa, gry, Moist, Rec. = 1.5 ft	50-14-7-5 (21)	14.9	26.6	49.7	23.7
		A-2-4, Sa, brn, Moist, Rec. = 1.3 ft	4-2-2-2 (4)	5.3	0.9	87.7	11.4
		A-1-b, SaGr, brn, Moist, Rec. = 0.7 ft	8-5-4-6 (9)	12.6	53.8	35.7	10.5
		A-1-a, SaGr, brn, Wet, Rec. = 0.3 ft	7-4-5-4 (9)	10.2	64.1	30.1	5.8
10		A-2-4, GrSa, brn, Wet, Rec. = 0.5 ft	11-5-4-4 (9)	24.1	27.7	54.4	17.9
		A-1-a, Gr, brn, Wet, Rec. = 0.5 ft	15-16-13-10 (29)	14.7	73.5	17.1	9.4
		A-1-a, Gr, brn, Wet, Rec. = 0.8 ft	15-16-25-44 (41)	11.7	75.5	16.0	8.5
		A-3, GrSa, brn, Wet, Rec. = 1.5 ft	40-13-12-15 (25)	19.3	25.2	64.7	10.1
20		A-1-b, SaGr, tan, Wet, Rec. = 0.8 ft	24-33-31-25 (64)	11.9	55.8	28.1	16.1
		A-1-b, SaGr, tan, Wet, Rec. = 1.1 ft	8-29-26-36 (55)	11.5	49.2	36.1	14.7
30		A-2-4, SiSa, brn, Wet, Rec. = 1.2 ft	10-15-16-15 (31)	23.8		68.8	31.2
		Cobbles, 33.0 ft - 35.0 ft					
		Cobbles, 36.0 ft - 37.0 ft					
40		A-4, SaSi, gry, Wet, Rec. = 0.7 ft	75-50/2 (100+)	9.8	19.7	33.1	47.2
		Cobbles, 41.0 ft - 42.0 ft					
		A-2-4, SaGrSi, gry, Wet, Rec. = 0.4 ft	100/5 (100+)	8.4	33.4	32.8	33.8
		Cobbles, 45.0 ft - 47.0 ft					
50		A-4, GrSaSi, gry, Wet, Rec. = 0.4 ft	100/5 (100+)	9.1	25.7	36.6	37.7
		Hole stopped @ 49.5 ft					

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

2010.COPY J1125101.GPJ VERMONT AOT.GDT 6/8/12

ABUT NO. 1
BOTTOM OF
PILE CAP
EL. 984.0

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-102**
Page No.: 1 of 2
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/17/12 Date Finished: 1/19/12
VTSPG NAD83: N 326686.47 ft E 1588110.59 ft
Station: 102+48.28 Offset: 13.9 RT
Ground Elevation: 994.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
01/18/12	7.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt, 0.0 ft - 0.5 ft							
		A-1-b, GrSa, gry, Moist, Rec. = 0.3 ft			25/4	5.2	39.0	44.5	16.5
		A-1-b, SaGr, tan, Moist, Rec. = 0.9 ft			5-12-9-8 (20)	4.6	45.2	40.8	14.0
		A-1-b, GrSa trace asphalt at 6 ft, gry, Rec. = 0.8 ft			9-6-3-3 (9)	3.4	41.9	45.3	12.8
		A-1-b, GrSa, tan, Moist							
		A-1-a, SaGr, brn, Moist, Rec. = 0.4 ft			5-7-13-9 (20)	5.3	53.1	37.5	9.4
10		A-2-4, Sa, tan, Moist, Rec. = 1.1 ft			2-3-4-7 (7)	10.8	6.9	79.2	13.9
		A-1-a, SaGr, brn, Moist, Rec. = 0.8 ft			6-9-19-25/1 (28)	4.2	50.5	40.4	9.1
		Cobbles and boulders, 14.0 ft - 18.0 ft							
		A-4, SiSa, brn, MTW, Rec. = 1.5 ft			14-17-19-16 (36)	28.8		62.1	37.9
20		A-2-4, SiSa, brn, MTW			16-17-14-18 (31)	25.6		73.2	26.8
		A-2-4, SiSa, brn, Moist			13-18-21-21 (39)	25.4		75.2	24.8
		A-2-4, Sa, tan, Wet, Rec. = 1.4 ft			8-17-19-16 (36)	24.3	1.8	83.8	14.4
		Cobbles, 27.5 ft - 28.5 ft							
30		A-1-b, SiSaGr, gry, Wet, Rec. = 1.1 ft			35-38-17 (55)	12.8	39.3	38.1	22.6
		Cobbles, 32.0 ft - 34.0 ft							
		A-1-b, SaGr, brn, Wet, Rec. = 0.9 ft			21-19-30-32 (49)	10.9	53.8	33.1	13.1
		Cobble, 36.0 ft - 36.5 ft							
40		A-4, SaSi, brn, Wet, Rec. = 1.2 ft			19-25-50/4 (75+)	24.1	13.7	34.1	52.2
		42.0 ft - 52.0 ft, NXDC, Cored glacial till from 42 to 52 feet. Visual classification: Silty sand with gravel.							
50									

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

2010.COPY J1125101.GPJ VERMONT AOT.GDT 6/8/12

930

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-102**
Page No.: 2 of 2
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/17/12 Date Finished: 1/19/12
VTSPG NAD83: N 326686.47 ft E 1588110.59 ft
Station: 102+48.28 Offset: 13.9 RT
Ground Elevation: 994.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
01/18/12	7.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
60		A-4, SaGrSi, gry, Wet, Rec. = 1.2 ft			26-51-46-50/3 (97)	9.3	32.5	29.9	37.6
		Visual Class:, broken rock with silt and sand, gry, Wet, Rec. = 0.3 ft			50/4 (50+)	26.3			
		Possible cobbles, 61.0 ft - 64.0 ft							
70		64.0 ft - 74.0 ft, Gry, Micaceous Schist, Hard to very hard, Fresh, Fair rock, NXDC, Joints close to moderately close spacing	1 (25-45)	95 (74)	Top of Bedrock @ 64.0 ft				
		Hole stopped @ 74.0 ft							
80									
90									
100									

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

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EST. PILE PENETRATION

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10J068borlogs.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: VTRANS
BORING LOGS (1 OF 3)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.. GUYETTE
SHEET 32 OF 73

VHB 57435

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-103**
Page No.: 1 of 1
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/26/12 Date Finished: 1/26/12
VTSPG NAD83: N 326659.70 ft E 1588164.46 ft
Station: 102+82.42 Offset: 63.0 RT
Ground Elevation: 992.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
01/26/12	10.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Visual Class:, Sandy Gravel, brn, Moist, Rec. = 0.3 ft	21-5-5-5 (10)	13.8			
		A-1-a, SaGr, gry, Moist, Rec. = 0.5 ft	20-10-15-8 (25)	7.7	51.7	37.0	11.3
		A-1-b, GrSa, brn, Moist, Rec. = 0.7 ft	16-10-6-9 (16)	16.5	35.6	48.9	15.5
		A-1-b, GrSa, brn, Moist, Rec. = 0.4 ft	3-7-6-10 (13)	12.3	38.1	48.0	13.9
10		A-1-a, SaGr, brn, Wet, Rec. = 0.8 ft	40-67-24-38 (91)	8.7	68.0	23.0	9.0
		A-1-a, SaGr, brn, Wet, Rec. = 1.0 ft	49-50-67-50/4 (117)	9.3	57.5	29.1	13.4
		Cobble, 14.0 ft - 14.5 ft					
		A-2-4, GrSiSa, brn, Wet, Rec. = 0.9 ft	16-15-9-13 (24)	17.9	25.1	44.2	30.7
		A-2-4, Sa, brn, Wet, Rec. = 1.7 ft	21-14-20-19 (34)	23.5	7.1	76.6	16.3
20		A-2-4, Sa, brn, Wet, Rec. = 1.5 ft	15-18-21-17 (39)	20.3	15.3	68.1	16.6
		A-2-4, SiSa, brn, Wet, Rec. = 1.8 ft	16-19-22-16 (41)	27.7		78.5	21.5
30		A-2-4, Sa, brn, Wet, Rec. = 1.6 ft	13-20-25-13 (45)	25.2		82.7	17.3
		A-2-4, SiSa, brn, Wet, Rec. = 1.4 ft	19-21-24-27 (45)	21.9	9.3	66.4	24.3
		Cobble, 37.0 ft - 38.0 ft					
40		A-1-b, SaGr, brn, Wet, Rec. = 1.4 ft	29-25-29-26 (54)	12.4	47.7	37.0	15.3
		A-4, GrSiSa, gry, Wet, Rec. = 1.7 ft	25-33-29-31 (62)	12.8	23.3	40.4	36.3
50		A-4, GrSaSi, gry, Wet, Rec. = 0.9 ft	27-73-50/2 (100+)	11.2	23.1	36.6	40.3
		Hole stopped @ 50.2 ft					

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

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STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-104**
Page No.: 1 of 1
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/30/12 Date Finished: 1/30/12
VTSPG NAD83: N 326788.52 ft E 1588166.51 ft
Station: 103+40.22 Offset: 51.3 LT
Ground Elevation: 998.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
01/30/12	7.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Ashpalt, 0.0 ft - 0.7 ft		9.4	48.9	35.2	15.9
		A-1-b, SaGr, brn, Moist, Rec. = 1.8 ft	39-58-39-23 (97)	7.4	38.8	45.1	16.1
		A-1-b, GrSa, brn, Moist, Rec. = 1.2 ft	12-10-4-7 (14)				
		Visual Class:, sandy gravel, red-brn, Moist, Rec. = 0.3 ft	20-50/0 (50+)				
		Cobble, 6.0 ft - 7.0 ft					
		A-2-4, SiGrSa, brn, Wet, Rec. = 0.9 ft	8-10-7-8 (17)	21.1	31.7	47.2	21.1
10		Visual Class:, stone with silty sand, brn, Wet, Rec. = 0.4 ft	10-6-10-8 (16)	14.7			
		Gravel lodged in tip of sampler, Rec. = 0.1 ft, 12.0 ft - 14.0 ft	6-7-5-4 (12)				
		Visual Class:, silty sandy gravel, yel-brn, Wet, Rec. = 0.3 ft	10-6-7-18 (13)				
		A-2-4, SaSiGr, gry-brn, Wet, Rec. = 1.0 ft	15-15-10-13 (25)	19.7	42.6	22.7	34.7
20		A-4, SiSa, brn, Wet, Rec. = 1.7 ft	19-15-18-18 (33)	26.5	3.3	51.6	45.1
		A-4, SiSa, brn, Wet, Rec. = 1.9 ft	18-17-20-15 (37)	24.2	6.0	48.2	45.8
		A-2-4, SiSa, brn, Wet, Rec. = 1.5 ft	15-19-20-25 (39)	25.7	6.8	62.6	30.6
30		A-2-4, SiSa, brn-gry, Wet, Rec. = 1.4 ft	18-19-20-22 (39)	21.4	7.1	66.5	26.4
		A-2-4, SiSa, red-brn, Wet, Rec. = 1.3 ft	21-18-23-20 (41)	24.5	4.9	70.5	24.6
40		A-4, SaSi, gry, Wet, Rec. = 1.8 ft	36-36-40-36 (76)	15.8	15.1	37.9	47.0
		Cobble, 42.0 ft - 43.0 ft					
		A-2-4, GrSiSa, gry, Wet, Rec. = 1.3 ft	49-38-42-61 (80)	12.8	26.0	45.4	28.6
50		Rec. = 0.0 ft, 49.0 ft - 49.0 ft	50/0 (50+)				
		Hole stopped @ 49.0 ft					

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

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ABUT NO. 2
BOTTOM OF
PILE CAP
EL. 986.5

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-105**
Page No.: 1 of 2
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/20/12 Date Finished: 1/24/12
VTSPG NAD83: N 326766.01 ft E 1588208.60 ft
Station: 103+72.35 Offset: 8.5 LT
Ground Elevation: 997.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
01/23/12	10.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec.; % (RQD; %)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt, 0.0 ft - 0.7 ft							
		Visual Class:, Gravel with asphalt, gry, Moist, Rec. = 0.2 ft			25/2				
		A-1-b, GrSa with asphalt, brn, Moist, Rec. = 1.1 ft			4-4-6-4 (10)	5.0	41.5	46.4	12.1
		A-3, Sa, brn, Moist, Rec. = 1.3 ft			4-4-5-4 (9)	2.7	0.6	91.5	7.9
		A-3, Sa, brn, Moist, Rec. = 1.5 ft			9-5-4-4 (9)	3.1	2.7	88.8	8.5
10		A-2-4, Sa, brn, MTW, Rec. = 0.8 ft			24-70/5 (70+)	14.6	6.9	75.3	17.8
		Cobbles, 11.0 ft - 13.5 ft							
		A-2-4, Sa, brn, Wet, Rec. = 1.2 ft			7-8-8-7 (16)	22.6	0.1	88.0	11.9
		A-2-4, Sa, brn, Wet, Rec. = 1.3 ft			4-9-11-11 (20)	23.2	0.1	86.4	13.5
20		A-4, Si, brn, Wet, Rec. = 1.3 ft			10-9-10-10 (19)	31.7		14.5	85.5
		A-4, Si, brn, Wet, Rec. = 1.5 ft			15-15-15-16 (30)	28.3	3.4	11.9	84.7
		A-2-4, Sa, brn, Moist, Rec. = 1.6 ft			15-19-19-16 (38)	22.6		86.2	13.8
30		Cobbles and boulders, 28.0 ft - 33.0 ft							
		A-4, SiSa, brn, Wet, Rec. = 1.5 ft			16-18-19-22 (37)	28.6		60.8	39.2
40		A-2-4, GrSiSa, gry-brn, Wet, Rec. = 1.4 ft			40-23-20-27 (43)	14.0	24.8	47.8	27.4
		A-2-4, GrSiSa, gry, Wet, Rec. = 1.7 ft			21-36-36-39 (72)	13.0	28.4	38.6	33.0
		Cobbles, 47.0 ft - 49.0 ft							
50		Rec. = 0.0 ft, 49.0 ft - 49.0 ft			50/0 (50+)				
		Cobbles, 49.1 ft - 52.0 ft							

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
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EST. PILE PENETRATION

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10J068borlogs.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: VTRANS
BORING LOGS (2 OF 3)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 33 OF 73

VHB 57435

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-105**
Page No.: 2 of 2
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/20/12 Date Finished: 1/24/12
VTSPG NAD83: N 326766.01 ft E 1588208.60 ft
Station: 103+72.35 Offset: 8.5 LT
Ground Elevation: 997.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

Groundwater Observations		
Date	Depth (ft)	Notes
01/23/12	10.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Probable weathered rock, 52.0 ft - 53.5 ft							
		53.5 ft - 55.0 ft							
		55.0 ft - 59.0 ft, Gry, Phyllitic Schist, Hard, Slightly weathered, Poor rock, NXDC	1 (?)	58 (15)	Top of Bedrock @ 55.0 ft				
60		59.0 ft - 64.0 ft, Gry, Phyllitic Schist, Very hard, Fresh, Very good rock, NXDC	2 (60)	100 (80)					
		64.0 ft - 69.0 ft, Gry, Phyllitic Schist, Very hard, Fresh, Very good rock, NXDC	3 (65)	100 (92)					
70		Hole stopped @ 69.0 ft							
80									
90									
100									

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

EST. PILE PENETRATION

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

LUDLOW
BRF 025-1 (42)

Boring No.: **B-106**
Page No.: 1 of 1
Pin No.: 10J068
Checked By: SMC

Boring Crew: Geosearch, Inc. Fitchburg, MA, MJC
Date Started: 1/25/12 Date Finished: 1/25/12
VTSPG NAD83: N 326737.73 ft E 1588255.17 ft
Station: 103+99.60 Offset: 38.6 RT
Ground Elevation: 998.0 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto/N	
Rig:	CME 75	C_E = 1.3

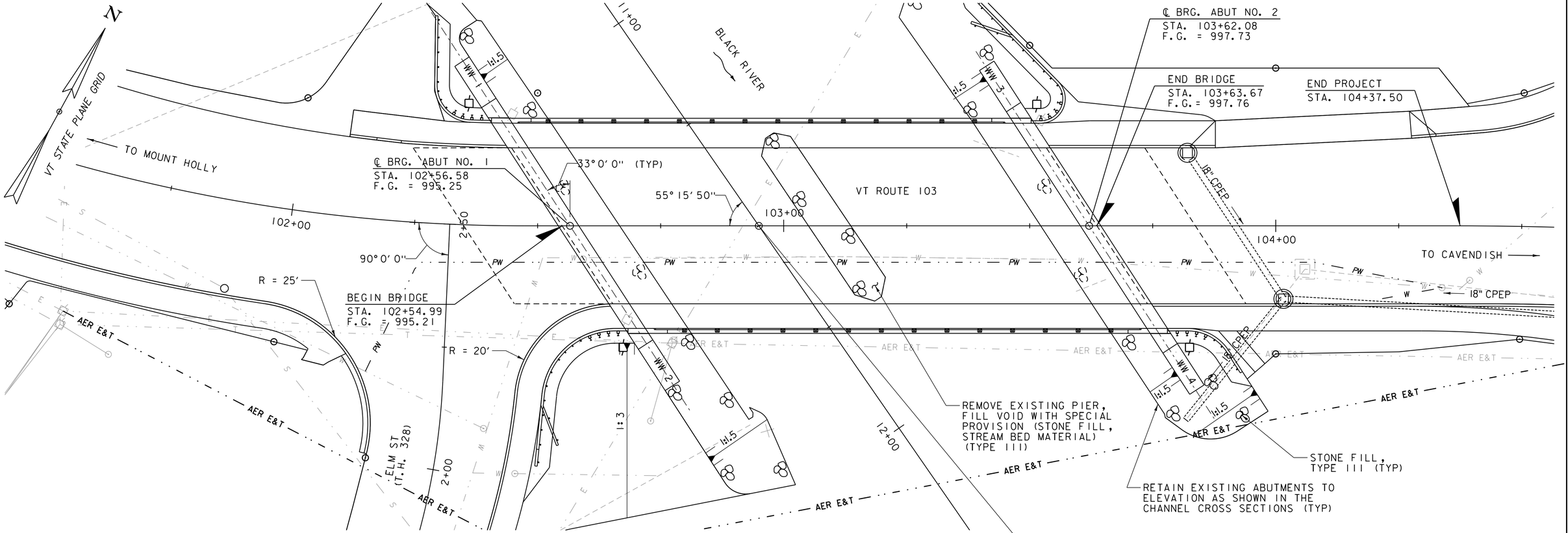
Groundwater Observations		
Date	Depth (ft)	Notes
01/25/12	15.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-2-4, GrSiSa topsoil, brn, Moist, Rec. = 1.2 ft	3-2-3-4 (5)	43.7	21.2	45.3	33.5
		A-1-a, SaGr, brn, Moist, Rec. = 0.8 ft	8-8-5-4 (13)	5.3	51.7	37.7	10.6
		A-1-a, SaGr broken rock within sample; thin layer buried topsoil within sample, brn, Moist, Rec. = 0.4 ft	6-10-6-4 (16)	11.0	55.6	30.3	14.1
		A-1-b, SiGrSa, brn, Moist, Rec. = 0.6 ft	4-5-5-6 (10)	11.4			
10		Gravel lodged in tip of sampler, gry, Moist, Rec. = 0.1 ft, 10.0 ft - 10.1 ft	50/1 (50+)				
		Cobbles and boulders, 10.5 ft - 13.0 ft					
		Cobbles, 14.0 ft - 15.0 ft					
		A-1-a, SaGr, brn, Wet, Rec. = 1.1 ft	87-28-20-50/3 (48)	10.4	63.5	23.8	12.7
		A-1-a, Gr sample mostly broken rock, gry, Wet, Rec. = 0.7 ft	70-21-21-25 (42)	11.0	69.3	19.5	11.2
20		A-2-4, Sa, brn, Wet, Rec. = 1.2 ft	14-9-13-12 (21)	21.6	5.5	77.1	17.4
		A-2-4, Sa, brn, Wet, Rec. = 1.4 ft	12-9-9-8 (18)	19.2	2.7	85.0	12.3
30		A-4, Si, brn, Wet, Rec. = 1.2 ft	6-5-4-5 (9)	27.8	0.4	14.3	85.3
		A-2-4, Sa, brn, Wet, Rec. = 1.8 ft	17-17-18-22 (35)	20.2	0.8	82.2	17.0
40		A-2-4, SiSa, brn, Wet, Rec. = 1.3 ft	13-11-14-12 (25)	23.5	8.0	60.1	31.9
		Cobbles, 43.0 ft - 44.0 ft					
		A-2-4, SiSa, gry, Wet, Rec. = 1.2 ft	22-22-20-18 (42)	13.2	18.5	49.2	32.3
		Cobbles, 47.0 ft - 49.0 ft					
50		A-2-4, GrSiSa broken rock within sample, gry, Wet, Rec. = 0.7 ft	29-26-25-26 (51)	11.6	26.4	41.0	32.6
		Hole stopped @ 51.0 ft					

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

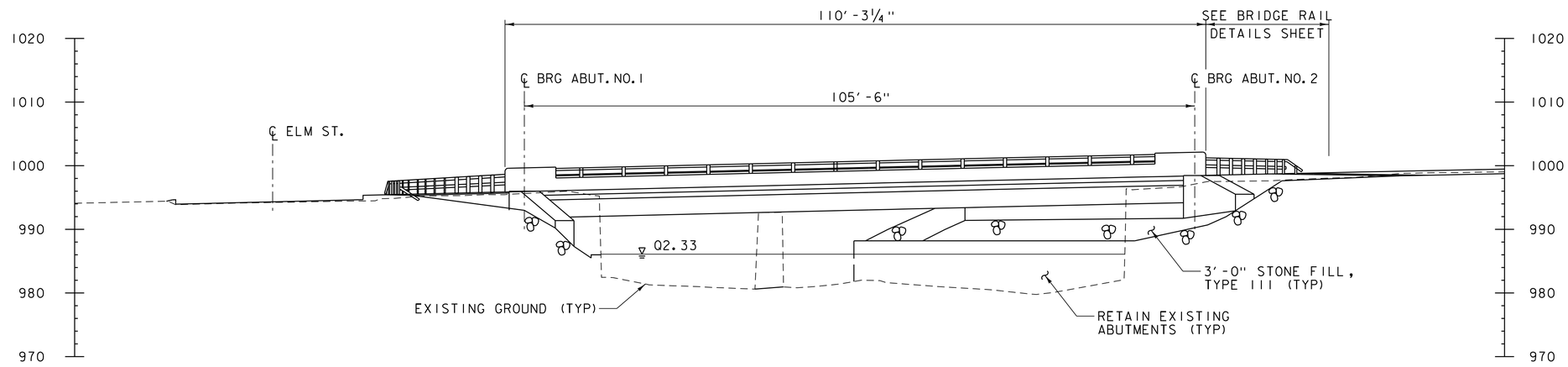
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10J068borlogs.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: VTRANS	CHECKED BY: A.P. GUYETTE
BORING LOGS (3 OF 3)	SHEET 34 OF 73

VHB 57435



PLAN

SCALE 1" = 10'-0"

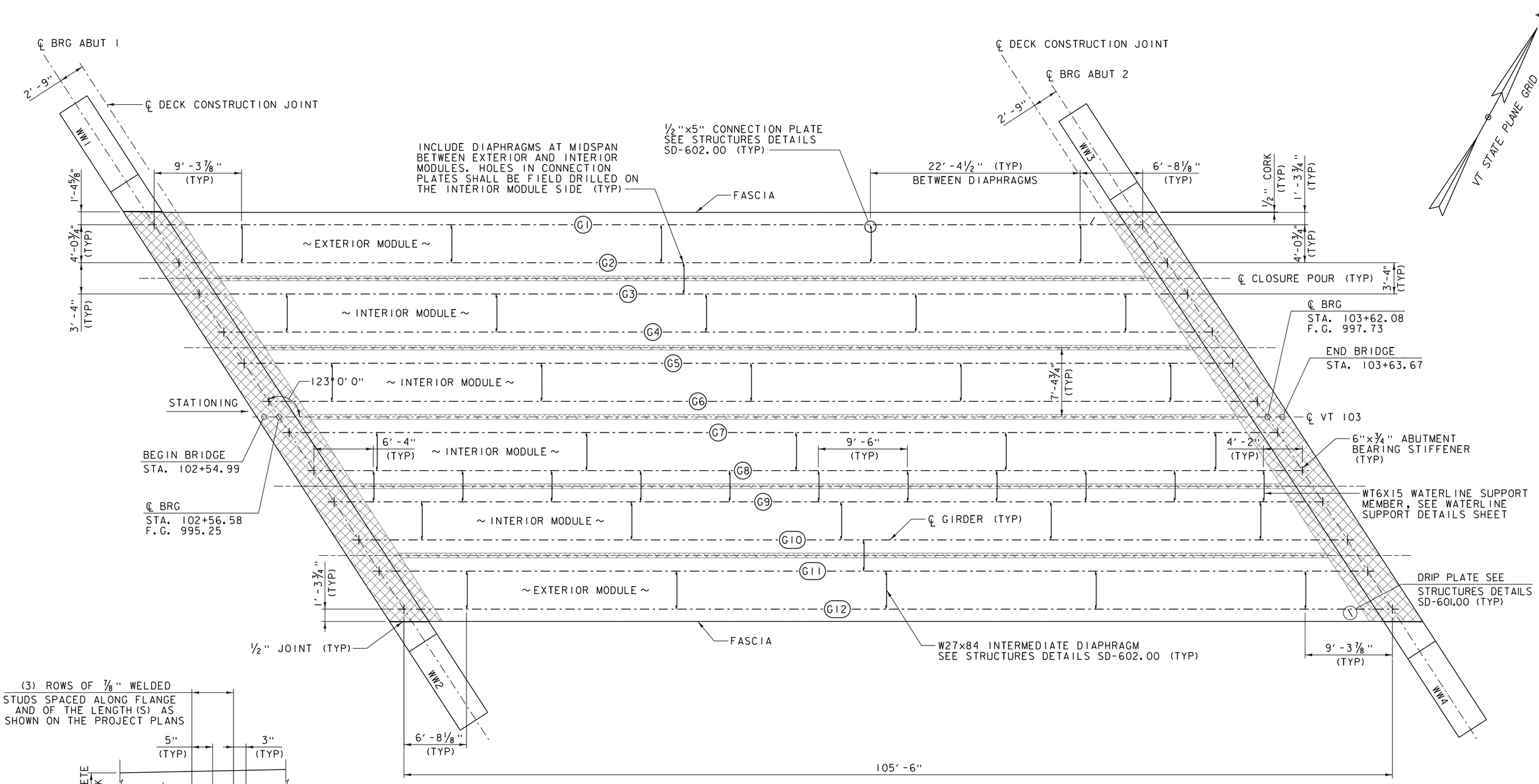


ELEVATION

SCALE 1" = 10'-0"

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BHF 025-1(42)
FILE NAME: z10j068pe.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
PLAN AND ELEVATION	SHEET 35 OF 73

VHB 57435



DECK AND FRAMING PLAN

SCALE 3/16" = 1'-0"

NOTE:

THE 3" HORIZONTAL SECTION MAY BE ELIMINATED FOR FORMING SYSTEMS DESIGNED FOR THE CONSTRUCTION OF VERTICAL HAUNCHES. ANY VOIDS RESULTING FROM FORMING SYSTEM ELEMENTS SHALL BE FILLED WITH JOINT SEALER, POLYURETHANE MEETING THE REQUIREMENTS OF SECTION 524. THE COST OF THE JOINT SEALER, POLYURETHANE WILL BE CONSIDERED INCIDENTAL TO THE ADJACENT CONCRETE.

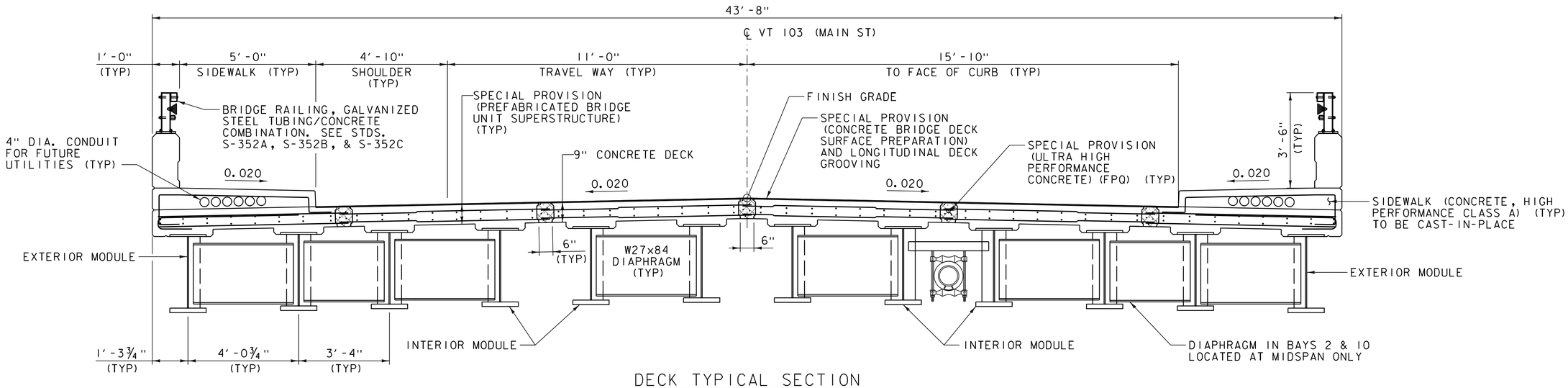
HAUNCH AND SHEAR CONNECTOR DETAIL

SCALE 1" = 1'-0"

SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z101j068sup.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
DECK AND FRAMING PLAN	SHEET 36 OF 73

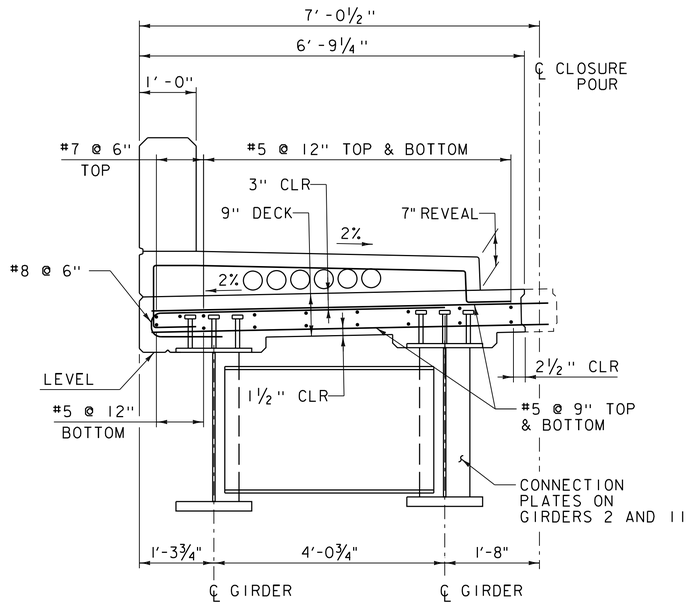
VHB 57435



DECK TYPICAL SECTION

SCALE ½" = 1'-0"

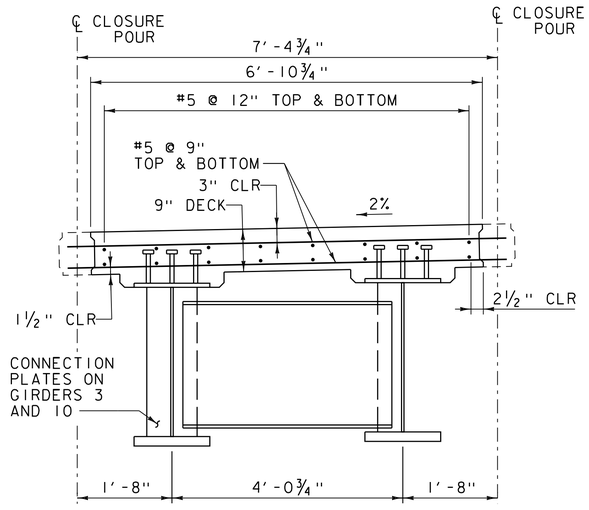
SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE) (FPQ)



EXTERIOR MODULE DETAIL

SCALE ¾" = 1'-0"

NOTE: SIDEWALK AND PARAPET TO BE CAST-IN-PLACE ONCE THE BEAMS HAVE BEEN ERECTED AND THE CLOSURE POURS HAVE BEEN FORMED AND CURED.

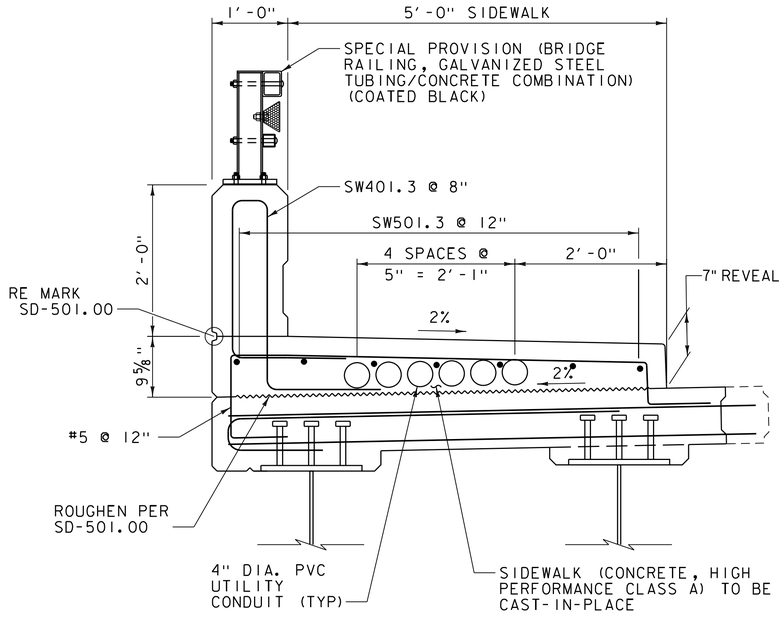


INTERIOR MODULE DETAIL

SCALE ¾" = 1'-0"

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



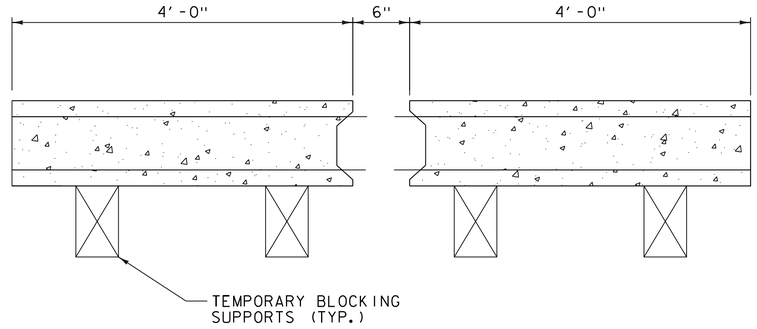
SIDEWALK WITH RAIL DETAIL

SCALE 1" = 1'-0"

NOTES:

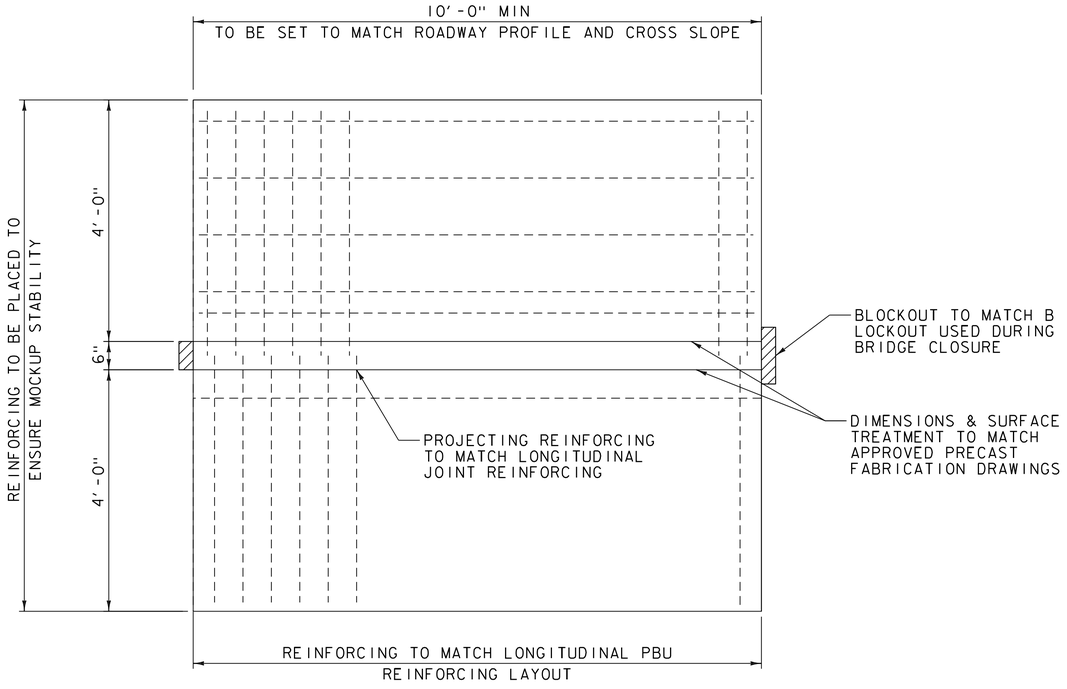
1. LONGITUDINAL BARS IN BRIDGE RAIL & DECK NOT SHOWN FOR CLARITY.
2. SEE STANDARD S-352A FOR ADDITIONAL CONCRETE RAILING REINFORCING.

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068sup.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
PBU DETAILS	SHEET 37 OF 73



PRECAST MOCKUP SECTION

NOT TO SCALE



PRECAST MOCKUP PLAN VIEW

NOT TO SCALE

NOTE:

A PRECAST CONCRETE MOCKUP REPRESENTING THE LONGITUDINAL DECK CLOSURE POUR SHALL BE CONSTRUCTED A MINIMUM OF THIRTY(30) DAYS PRIOR TO THE BRIDGE CLOSURE. THE MOCKUP SHALL REPRESENT THE FULL DEPTH LONGITUDINAL CLOSURE POUR BETWEEN PBUS (INCLUDING PROJECTING REINFORCING). UHPC PLACED IN THE MOCKUP SHALL BE PLACED PER THE METHOD OUTLINED IN THE APPROVED UHPC PLACEMENT SEQUENCE. THE MOCKUP SHALL INCLUDE TOP FORMING DETAILS, TOP FORMS, CHIMNEYS, BOTTOM FORMS, SEALING DETAILS, AND LONGITUDINAL BLOCKING DETAILS THAT ARE TO BE USED DURING THE ROAD CLOSURE PERIOD. THE MOCKUP SHALL MEET OR EXCEED THE DIMENSIONS SHOWN ON THIS SHEET AND SHALL BE ELEVATED AT A MINIMUM OF THIRTY-SIX (36) INCHES ABOVE GROUND LEVEL. THE LOCATION OF THE PRECAST MOCKUP SHALL BE OUTDOORS UNLESS APPROVED BY THE ENGINEER. A PORTABLE BATCHING UNIT SHALL BE SUPPLIED BY LAFARGE NORTH AMERICA FOR MIXING OF THE UHPC. THE CONTRACTOR SHALL FOLLOW THE BATCHING SEQUENCE AS SPECIFIED BY LAFARGE NORTH AMERICA. REPRESENTATIVES FROM LAFARGE SHALL BE ON-SITE DURING PLACEMENT OF UHPC IN THE MOCKUP TO ENSURE PROPER MIXING AND PLACEMENT. ALL COSTS ASSOCIATED WITH THIS WORK WILL BE CONSIDERED INCIDENTAL TO SPECIAL PROVISION 900.645 UHPC MOCKUP.

PROJECT NAME: LUDLOW

PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068sup.dgn | PLOT DATE: 8/23/2016

PROJECT LEADER: A.P. GUYETTE | DRAWN BY: M.F. SUFFEL

DESIGNED BY: A.P. GUYETTE | CHECKED BY: A.P. GUYETTE

PRECAST MOCKUP DETAIL | SHEET 38 OF 73

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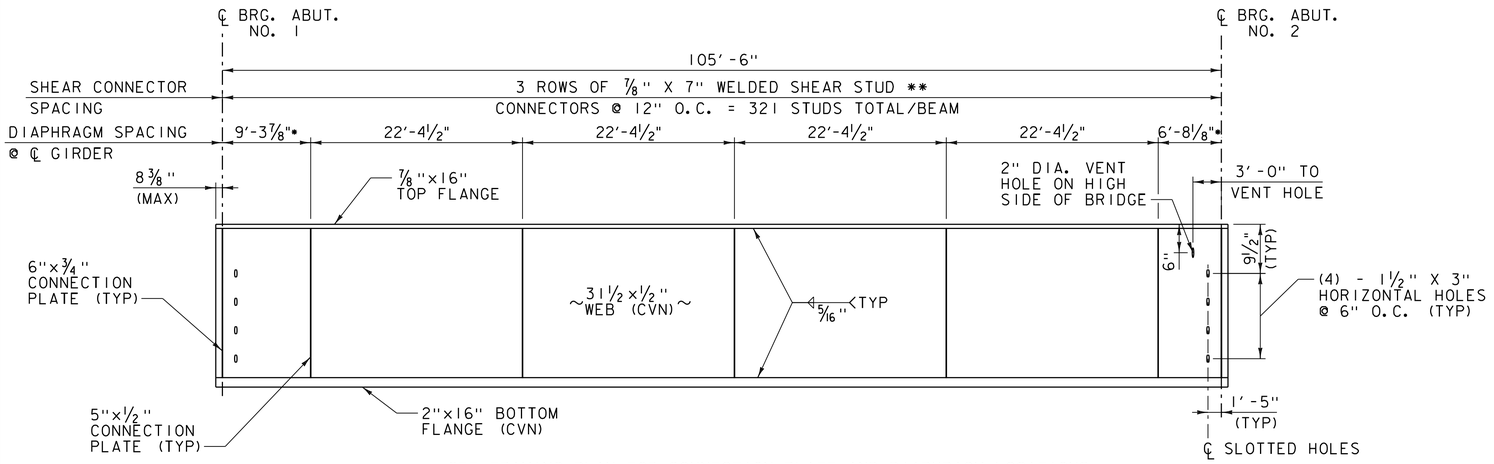
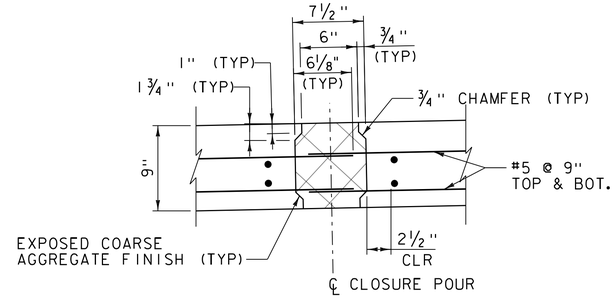


* - SEE FRAMING PLAN FOR CONNECTION PLATE AND DIAPHRAGM LOCATIONS
** - SEE PROJECT NOTES SHEET FOR STUD HEIGHT REQUIREMENTS

GIRDER ELEVATION

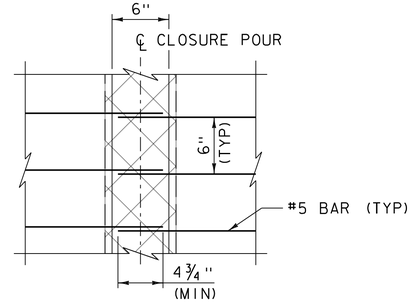
HORZ SCALE 1/8" = 1'-0"
VERT SCALE 3/4" = 1'-0"

CVN = CHARPY V-NOTCH TEST IN ACCORDANCE WITH SUBSECTION 714.01



FLANGE CONNECTION DETAIL SECTION

SCALE 1 1/2" = 1'-0"

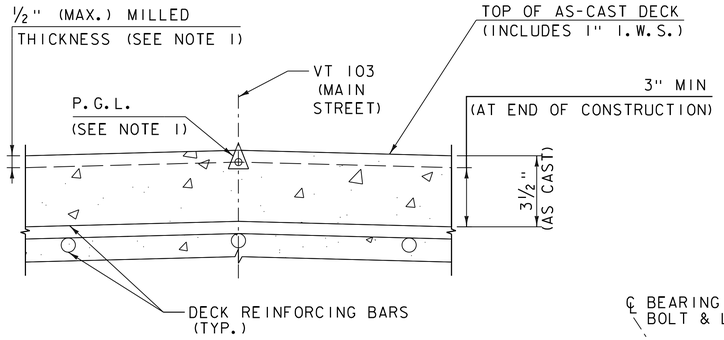


FLANGE CONNECTION DETAIL PLAN

NOT TO SCALE

SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE) (FPQ)

CAMBER & DEFLECTION - GIRDERS 1 THRU 12 (INCHES)											
POINT ON GIRDER	0	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	0
STEEL DL	0.00	0.55	1.03	1.42	1.66	1.74	1.66	1.42	1.03	0.55	0.00
CONCRETE SLAB	0.00	1.11	2.11	2.88	3.38	3.55	3.38	2.88	2.11	1.11	0.00
SUPERIMPOSED DL	0.00	0.33	0.62	0.84	0.99	1.04	0.99	0.84	0.62	0.33	0.00
TOTAL DEFLECTION	0.00	1.99	3.76	5.14	6.02	6.33	6.02	5.14	3.76	1.99	0.00
RESIDUAL CAMBER	0.00	0.51	0.98	1.35	1.61	1.74	1.71	1.50	1.13	0.61	0.00
TOTAL CAMBER	0.00	2.50	4.74	6.50	7.64	8.06	7.73	6.64	4.89	2.60	0.00

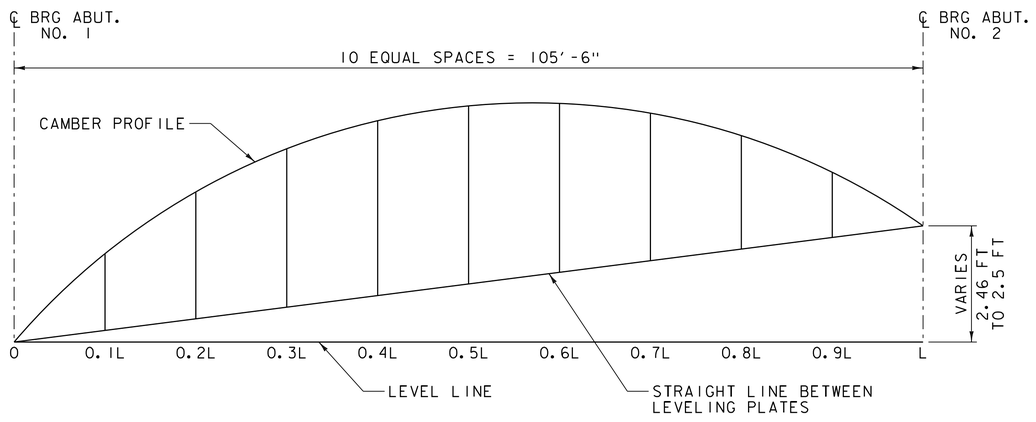


CONCRETE COVER DETAIL

NOT TO SCALE

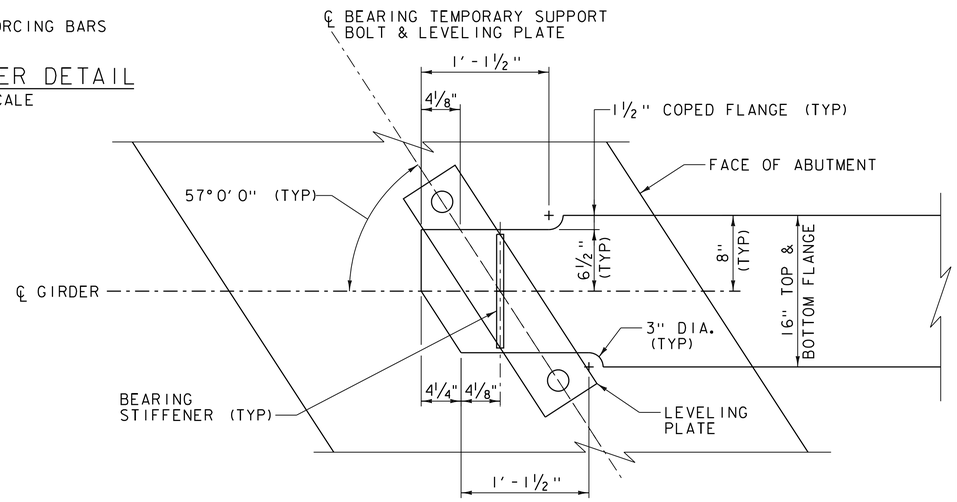
NOTES:

1. AS MILLED THICKNESS OF 1#2" FOR RIDEABILITY IS ASSUMED FOR DEFINITION OF P.G.L. (TOP OF OF AS-CAST DECK IS 1#2" ABOVE P.G.L.)
2. P.G.L. DENOTES PROFILE GRADE LINE.
3. I.W.S DENOTES INTEGRAL WEARING SURFACE



CAMBER DIAGRAM

NOT TO SCALE



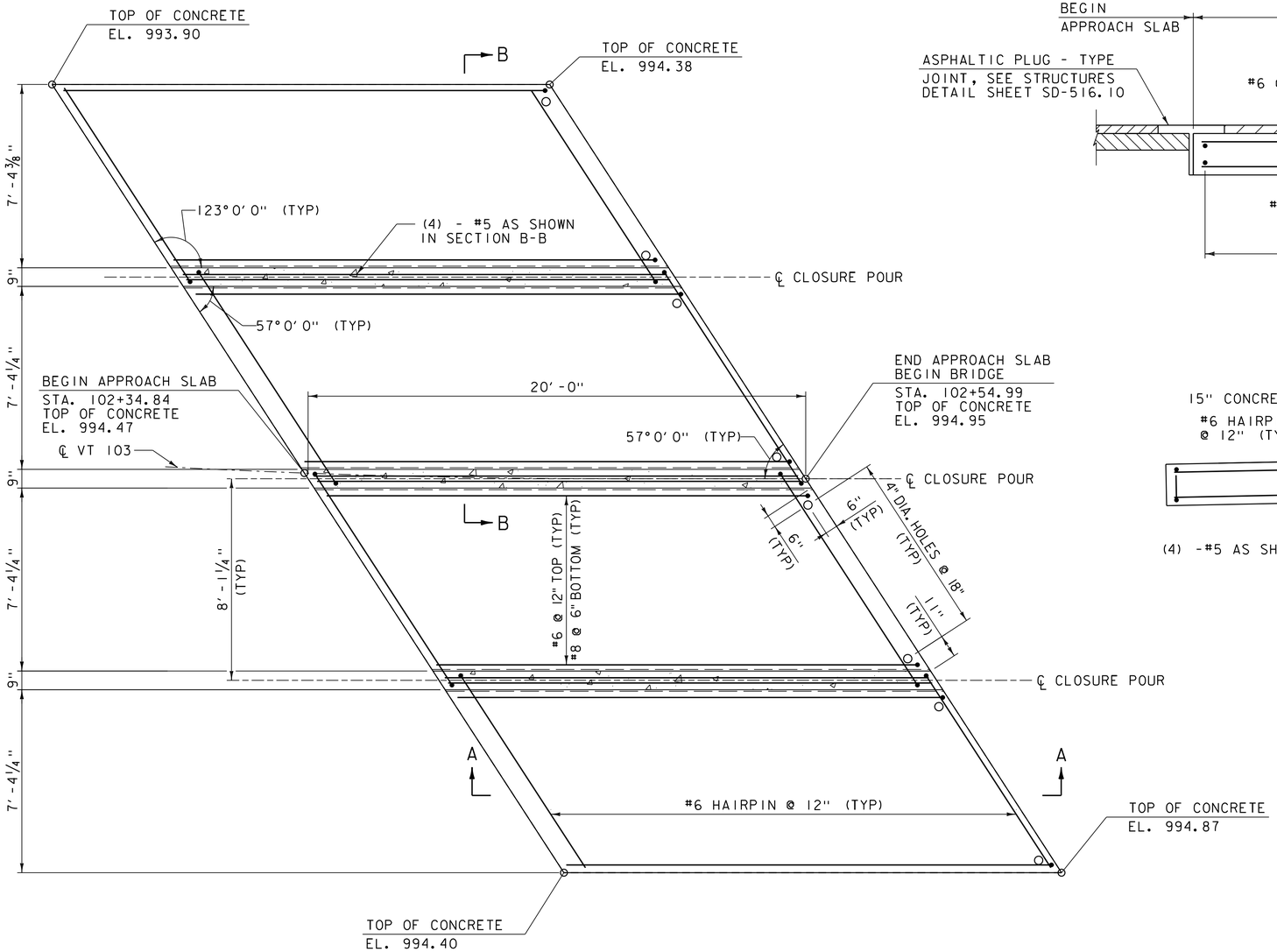
TYPICAL GIRDER END SECTION

SCALE 1 1/2" = 1'-0"

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

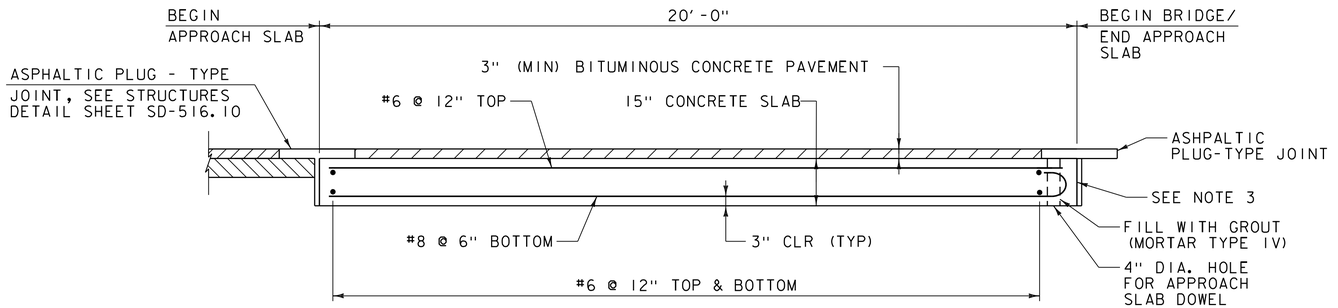
FILE NAME: z10j068sup.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
GIRDER DETAILS

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 39 OF 73



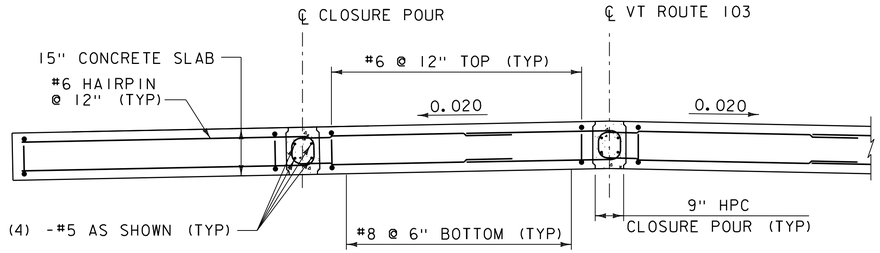
APPROACH SLAB NO. 1 PLAN

SCALE ⅜" = 1' -0"



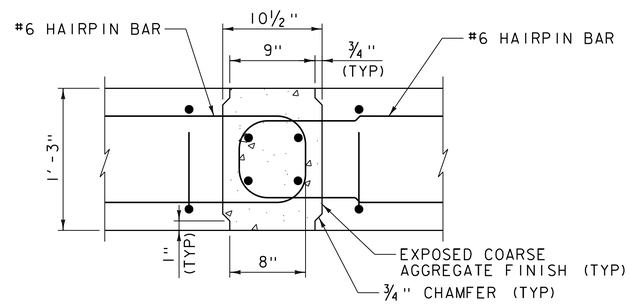
SECTION A-A

SCALE ½" = 1' -0"



SECTION B-B

SCALE ½" = 1' -0"



CONNECTION DETAIL

SCALE 1½" = 1' -0"

NOTES:

1. LIFTING POINTS IN APPROACH SLABS TO BE LOCATED BY FABRICATOR.
2. CONTRACTOR SHALL INCLUDE IN THE FABRICATION DRAWINGS THE METHOD AND DETAILS FOR ESTABLISHING CONTINUOUS CONTACT WITH SUBGRADE AND SUPPORT FOR PRECAST APPROACH SLABS.
3. FRONT FACE OF APPROACH SLAB SHALL BE VERTICAL WHEN PLACED ON APPROACH SLAB SEAT.

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2' -2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

▭ - LIMITS OF SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPO) CLOSURE POUR

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068slab.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
APPROACH SLAB DETAILS (1 OF 2)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 40 OF 73

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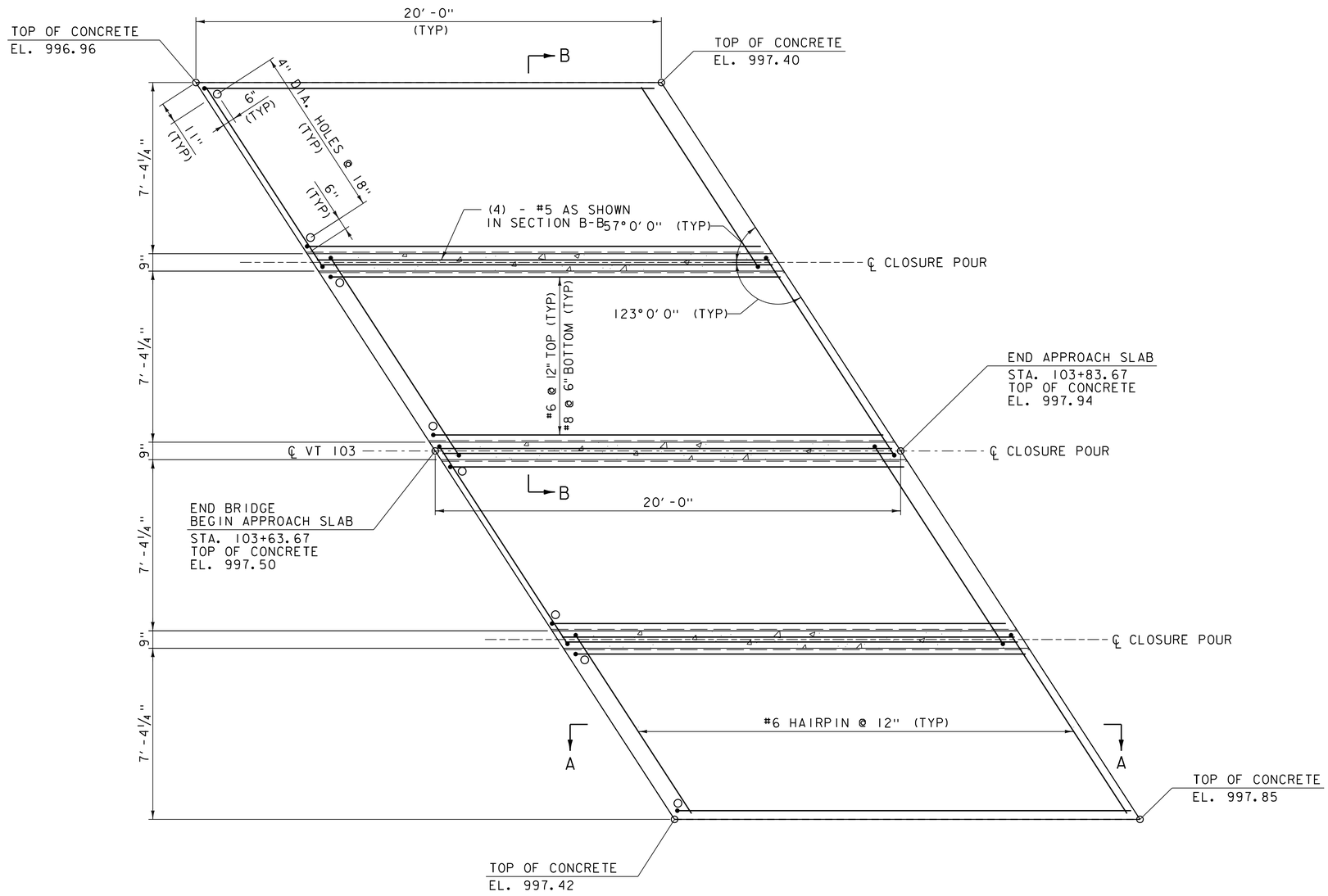


▭ - LIMITS OF SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ) CLOSURE POUR

NOTES:

1. LIFTING POINTS IN APPROACH SLABS TO BE LOCATED BY FABRICATOR.
2. CONTRACTOR SHALL INCLUDE IN THE FABRICATION DRAWINGS THE METHOD AND DETAILS FOR ESTABLISHING CONTINUOUS CONTACT WITH SUBGRADE AND SUPPORT FOR PRECAST APPROACH SLABS.
3. FRONT FACE OF APPROACH SLAB SHALL BE VERTICAL WHEN PLACED ON APPROACH SLAB SEAT.
4. SEE PRECAST APPROACH SLAB (1 OF 2) FOR CONNECTION DETAIL, SECTION A-A, AND SECTION B-B.

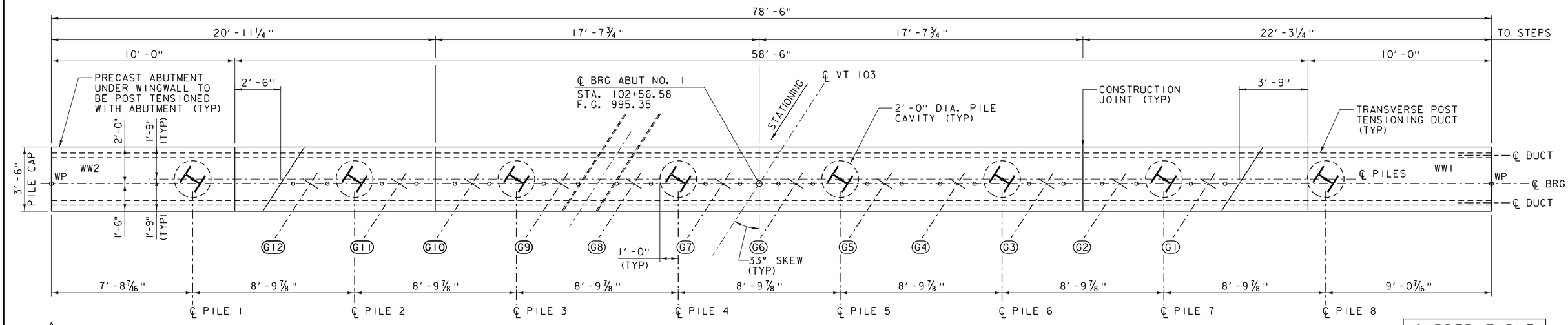
NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068slab.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
APPROACH SLAB DETAILS (2 OF 2)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 41 OF 73

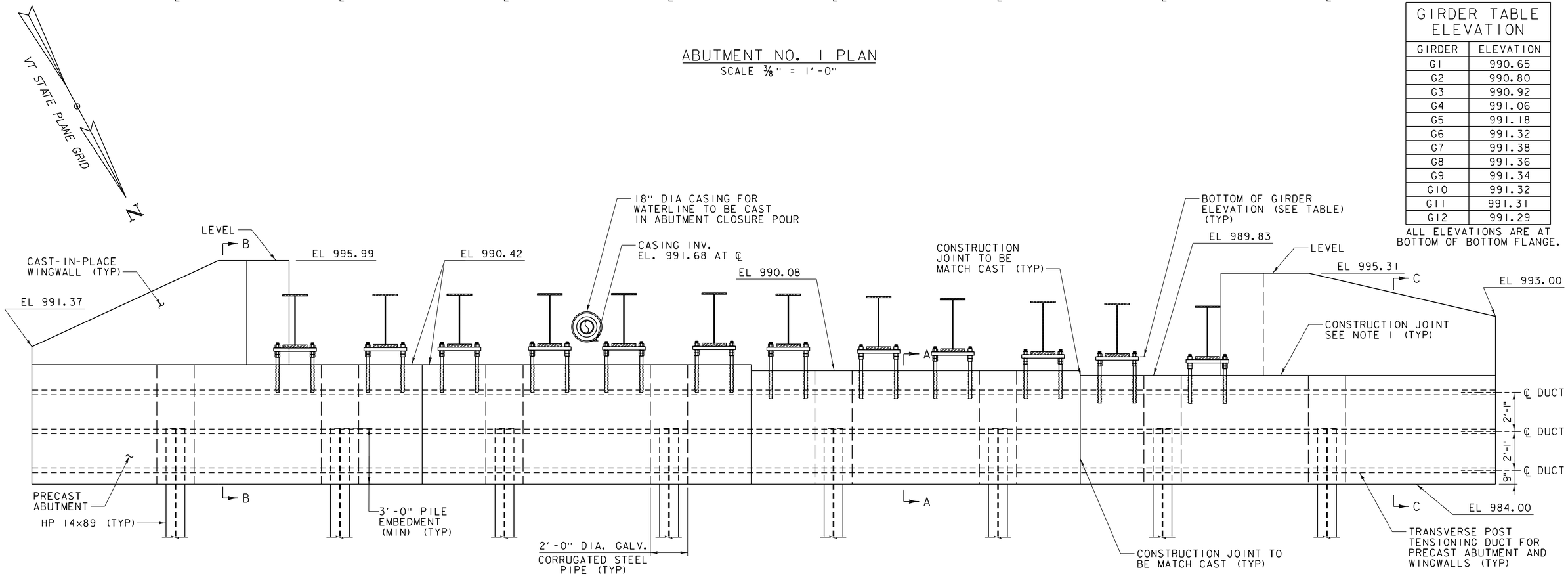


ABUTMENT NO. 1 PLAN

SCALE 3/8" = 1'-0"

GIRDER TABLE ELEVATION	
GIRDER	ELEVATION
G1	990.65
G2	990.80
G3	990.92
G4	991.06
G5	991.18
G6	991.32
G7	991.38
G8	991.36
G9	991.34
G10	991.32
G11	991.31
G12	991.29

ALL ELEVATIONS ARE AT BOTTOM OF BOTTOM FLANGE.



ABUTMENT NO. 1 ELEVATION

SCALE 3/8" = 1'-0"

SEE ABUTMENT SECTIONS SHEET FOR SECTIONS A-A AND B-B.

NOTES:

1. ABUTMENT TO BE PRECAST AS SHOWN. ONCE ABUTMENTS AND WINGWALLS ARE POST-TENSIONED, THE TOP PORTION OF THE WINGWALLS AND CHEEKWALLS ARE TO BE CAST-IN-PLACE.
2. USE 24" GALVANIZED CORRUGATED STEEL PIPE FOR PILE POCKETS CONFORMING TO SUBSECTION 711.01.

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068sub.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
ABUTMENT NO. 1 PLAN & ELEVATION

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 42 OF 73

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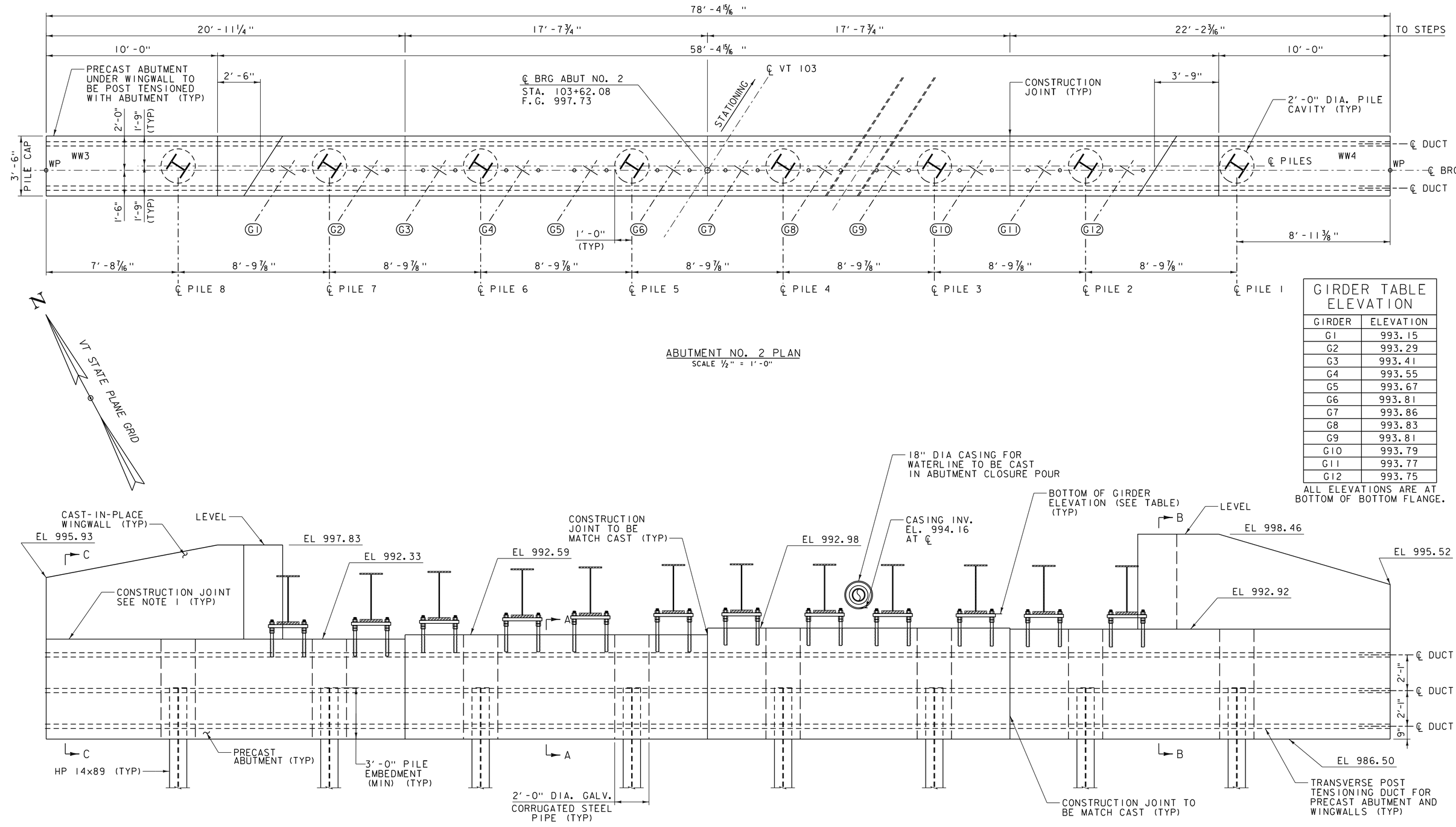

ABUTMENT NO. 2 PLAN
SCALE ½" = 1'-0"

GIRDER TABLE ELEVATION	
GIRDER	ELEVATION
G1	993.15
G2	993.29
G3	993.41
G4	993.55
G5	993.67
G6	993.81
G7	993.86
G8	993.83
G9	993.81
G10	993.79
G11	993.77
G12	993.75

ALL ELEVATIONS ARE AT BOTTOM OF BOTTOM FLANGE.

ABUTMENT NO. 2 ELEVATION
SCALE ⅜" = 1'-0"
SEE ABUTMENT SECTIONS SHEET FOR SECTIONS A-A AND B-B.

NOTES:
1. ABUTMENT TO BE PRECAST AS SHOWN. ONCE ABUTMENTS AND WINGWALLS ARE POST-TENSIONED, THE TOP PORTION OF THE WINGWALLS AND CHEEKWALLS ARE TO BE CAST-IN-PLACE.
2. USE 24" GALVANIZED CORRUGATED STEEL PIPE FOR PILE POCKETS CONFORMING TO SUBSECTION 711.01.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068sub.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
ABUTMENT NO. 2 PLAN & ELEVATION
PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 43 OF 73

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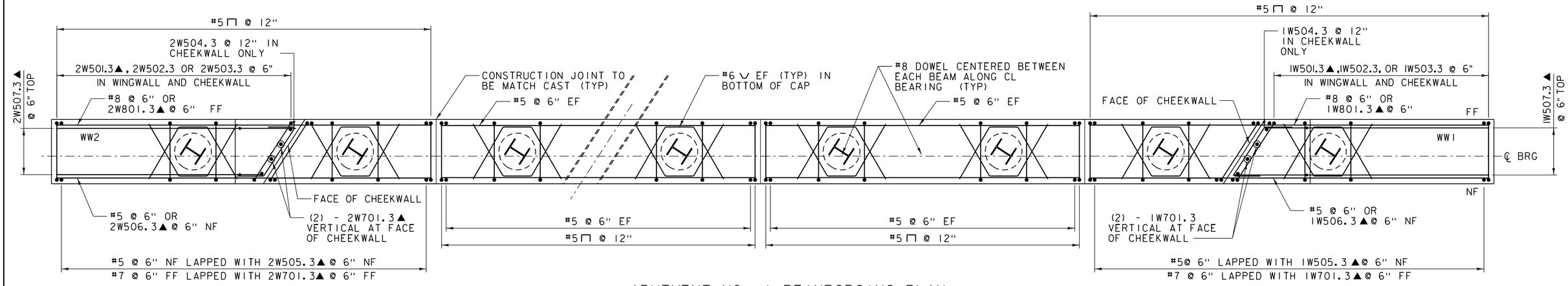


ABUTMENT NO. 1 REINFORCING PLAN

SCALE 3/8" = 1'-0"

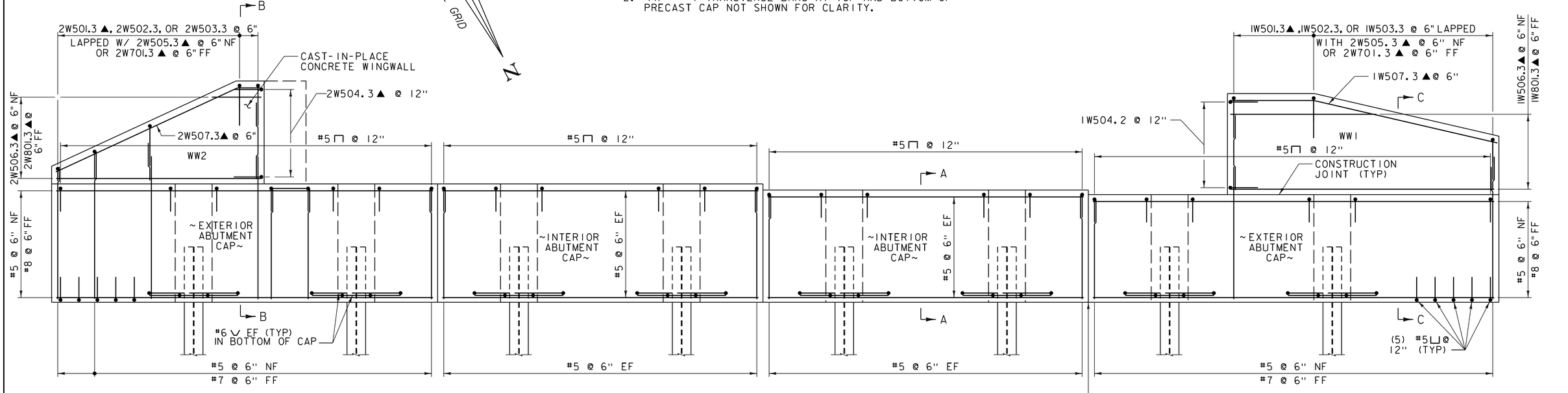
(ABUTMENT NO. 2 SIMILAR)

NOTES:

1. TRANSVERSE POST-TENSIONING DUCTS & GROUT DUCTS NOT SHOWN FOR CLARITY.
2. (4) - #7 TRANSVERSE BARS AT TOP AND BOTTOM OF PRECAST CAP NOT SHOWN FOR CLARITY.

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



ABUTMENT NO. 1 REINFORCING ELEVATION

SCALE 3/8" = 1'-0"

(ABUTMENT NO. 2 SIMILAR, 4W SIMILAR TO 1W, 3W SIMILAR TO 2W)

NOTES:

1. SEE ABUTMENT SECTIONS SHEET FOR SECTIONS A-A, B-B, AND C-C.
2. TOP PORTION OF WINGWALLS TO BE CAST-IN-PLACE.
3. THE BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO WINGWALL 2. ALL WORK TO INSTALL THE PLAQUE SHALL BE INIDENTAL TO THE APPROPRAITE CONCRETE CONTRACT ITEM. SEE SD-502.00 FOR FURTHER DETAILS.

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068sub.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
ABUTMENT REINFORCING	SHEET 44 OF 73

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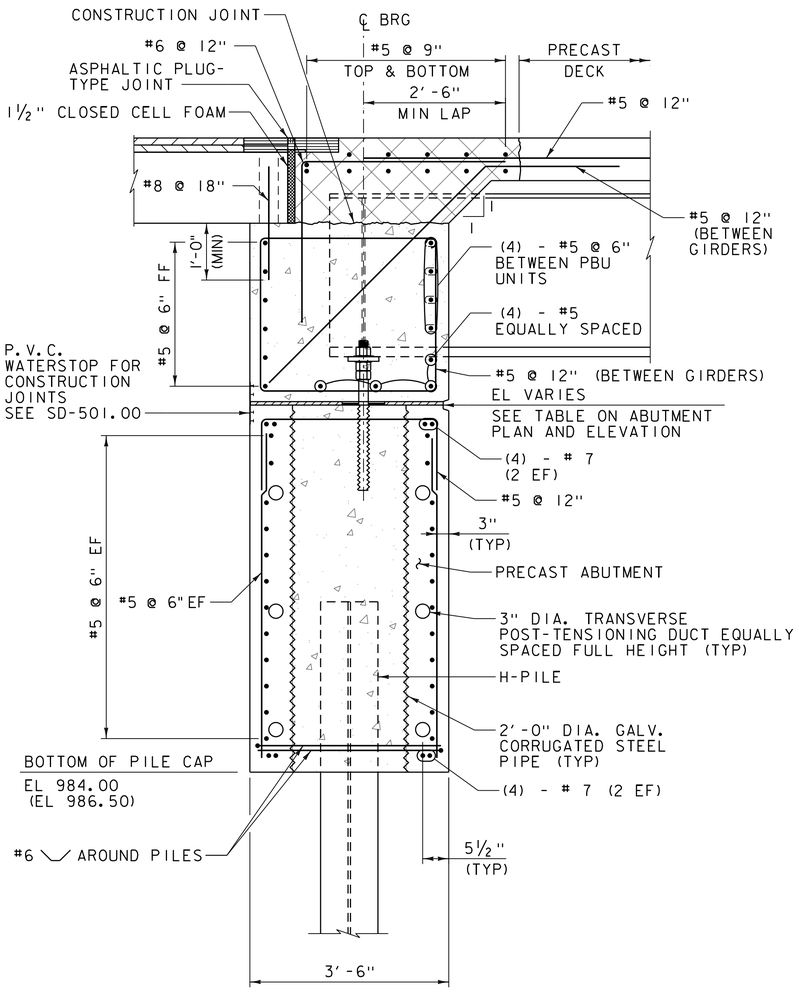
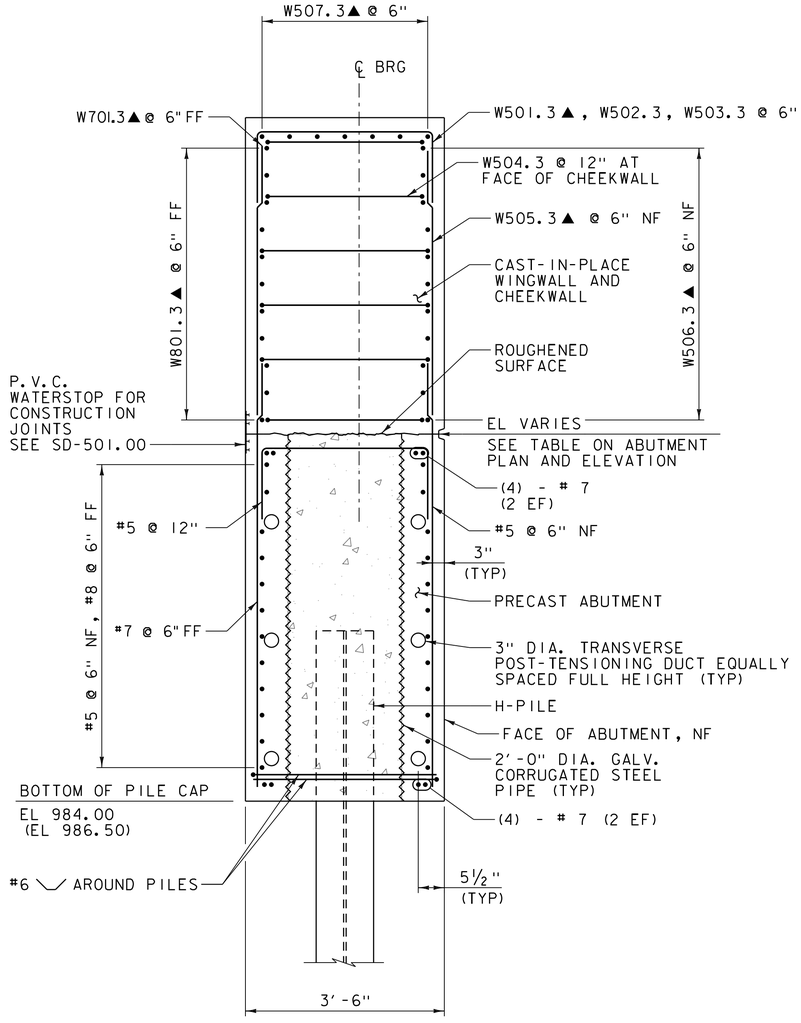


SECTION A-A

SCALE ¾" = 1'-0"

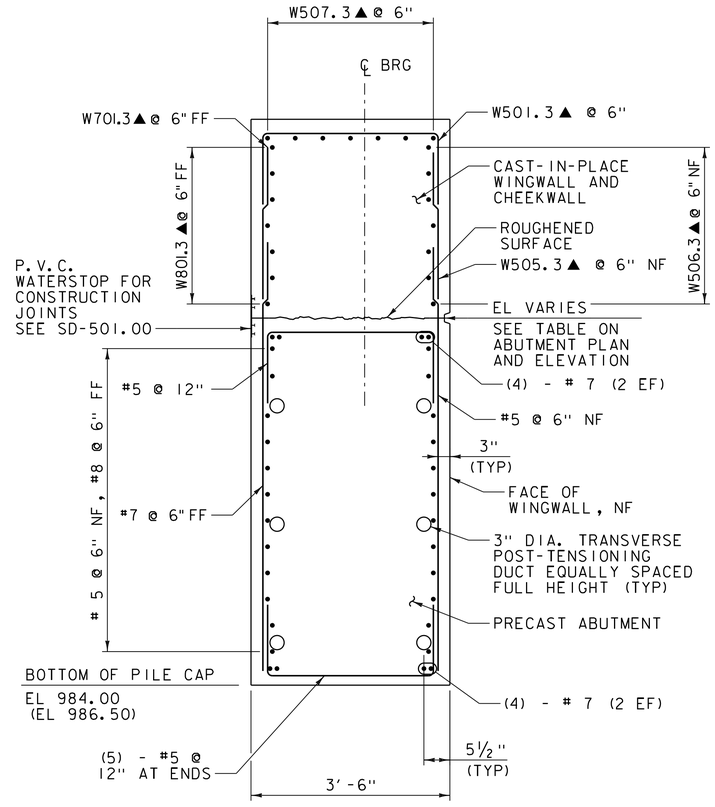
(SECTION TAKEN AT LONGITUDINAL JOINT)

NOTE: SECTION A-A CAP REINFORCING SHALL ONLY BE USED FOR INTERIOR ABUTMENT CAPS. SEE DETAILS B-B AND C-C FOR REINFORCING FOR EXTERIOR CAPS.



SECTION B-B

SCALE ¾" = 1'-0"



SECTION C-C

SCALE ¾" = 1'-0"

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

NOTES:

1. PAYMENT FOR TEMPORARY SUPPORT ASSEMBLIES WILL BE CONSIDERED INCIDENTAL TO RESPECTIVE 540.10 OR 900.645 ITEMS.
2. THE TOP SURFACE OF THE LEVELING PLATE SHALL BE GREASED PRIOR TO SETTING PBU'S. EXCESS GREASE SHALL BE WIPED CLEAN AFTER PBU'S HAVE BEEN SET.
3. LEVELING PLATES SHALL BE LEVEL PRIOR TO SETTING PBU'S. THE CONTRACTOR SHALL ADJUST THE PLATE ELEVATIONS DURING SETTING THE PBUs TO ACHIEVE THE DESIGN ELEVATIONS OF THE DECK.
4. LEVELING PLATE SHALL BE GALVANIZED GRADE 50 AND CONFORM TO SUBSECTION 714.03. ANCHOR RODS SHALL MEET THE REQUIREMENTS OF SUBSECTION 714.08 AND SHALL BE GRADE 105.
5. P.V.C. WATERSTOP WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE PRECAST ITEM.
6. SEE PROJECT NOTES FOR ADDITIONAL FABRICATION, CONSTRUCTION, AND SEQUENCE NOTES.
7. ELEVATIONS SHOWN ARE FOR ABUTMENT NO. 1. (ELEVATIONS FOR ABUTMENT NO. 2 ARE SHOWN IN PARENTHESIS.)

LEGEND

SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE) (FPO)

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE) (FPO)

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068sub.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
ABUTMENT DETAILS (1 OF 3)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 45 OF 73

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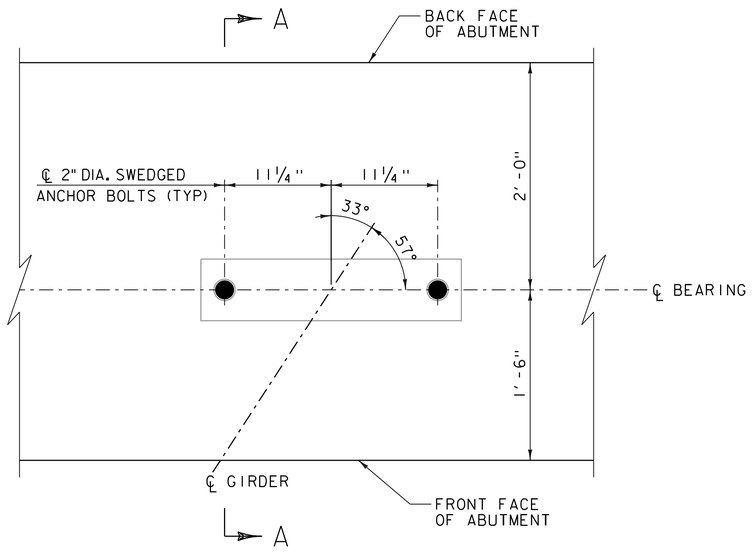
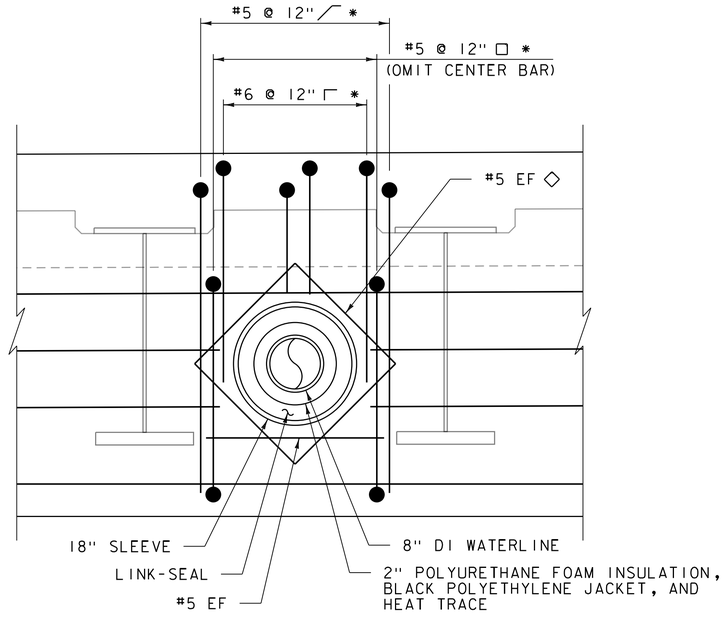


SUPPORT BOLT LAYOUT

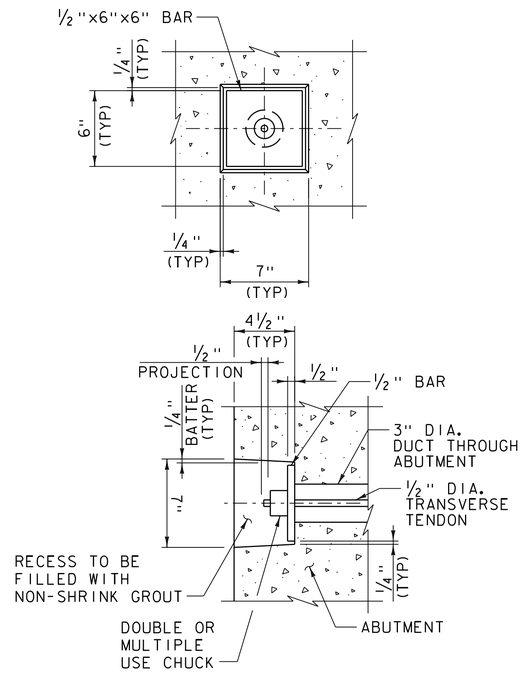
SCALE 1½" = 1'-0"



* SEE NOTE 1

WATERLINE ABUTMENT PENETRATION DETAIL

NOT TO SCALE



TRANSVERSE TENDON DETAIL

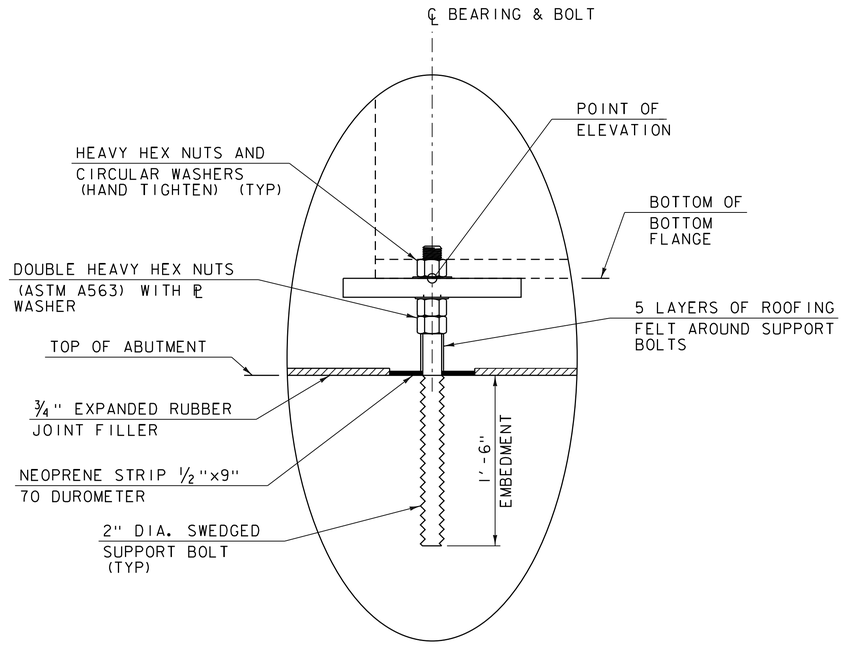
NOT TO SCALE

NOTES:

1. SPACE BARS TO MAINTAIN 1½" MIN CLR AROUND SLEEVE. FIELD CUT CENTER BARS TO MAINTAIN 1½" MIN CLR AROUND SLEEVE.
2. SLEEVE SHALL BE STEEL WITH 18" INSIDE DIA. AND SHALL BE COMPATIBLE WITH LINK-SEAL AND REINFORCING LAYOUT.

TRANSVERSE TENDON NOTES:

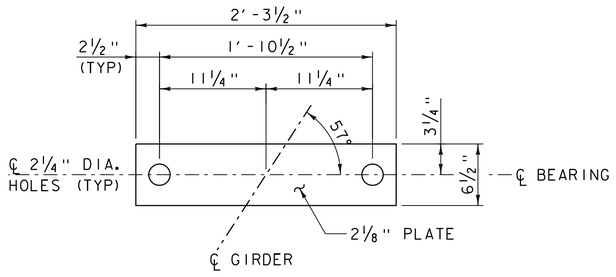
1. MORTAR FOR EXTERIOR POCKETS SHALL BE THE SAME COLOR AND TEXTURE AS THE ABUTMENT CONCRETE.
2. OTHER ANCHORAGE SYSTEMS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. ALTERNATE ANCHORAGE SYSTEMS SHALL BE WATER TIGHT AND CORROSION PROOF.
3. TRANSVERSE TENDONS SHALL BE COVERED BY A SEAMLESS POLYPROPYLENE SHEATH (WITH CORRSION INHIBITING GREASE BETWEEN THE STRAND/ANCHOR AND THE SHEATH) FOR THE FULL LENGTH OF THE TENDON/ANCHOR, EXCEPT AT THE ANCHORAGE LOCATION.



SECTION A-A

SUPPORT BOLT DETAIL

SCALE 1½" = 1'-0"



LEVELING PLATE

SCALE 1½" = 1'-0"

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

NOTES:

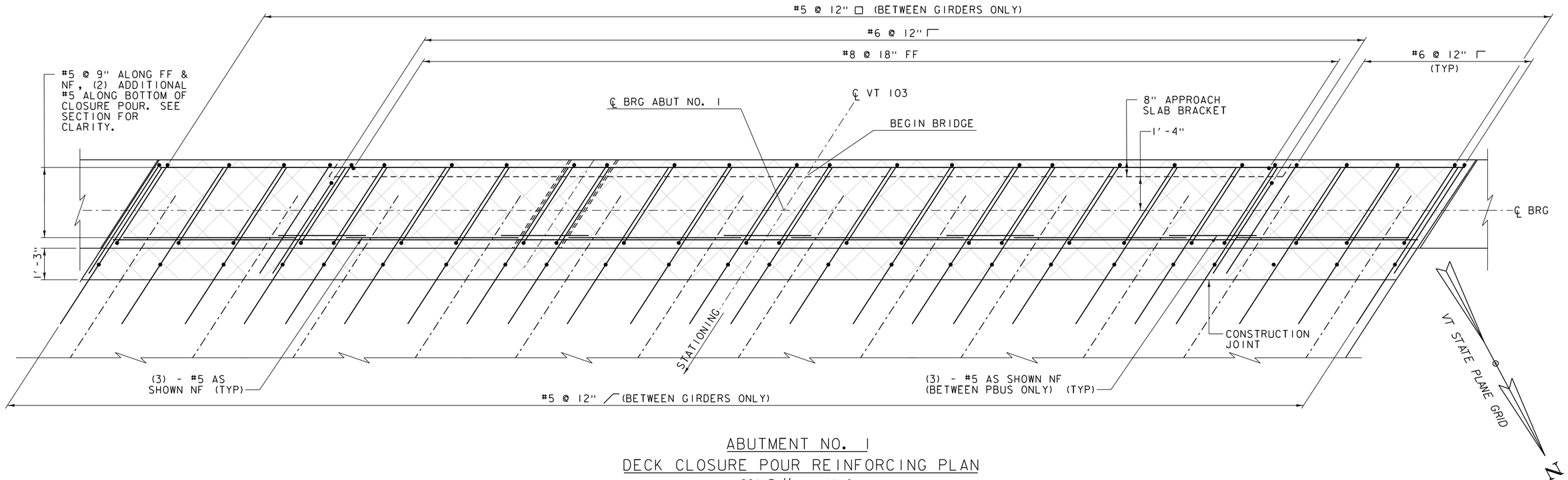
1. SEE ABUTMENT DETAILS (1 OF 3) AND PROJECT NOTES FOR ADDITIONAL FABRICATION, CONSTRUCTION, AND SEQUENCE NOTES.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068sub.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
ABUTMENT DETAILS (2 OF 3)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 46 OF 73

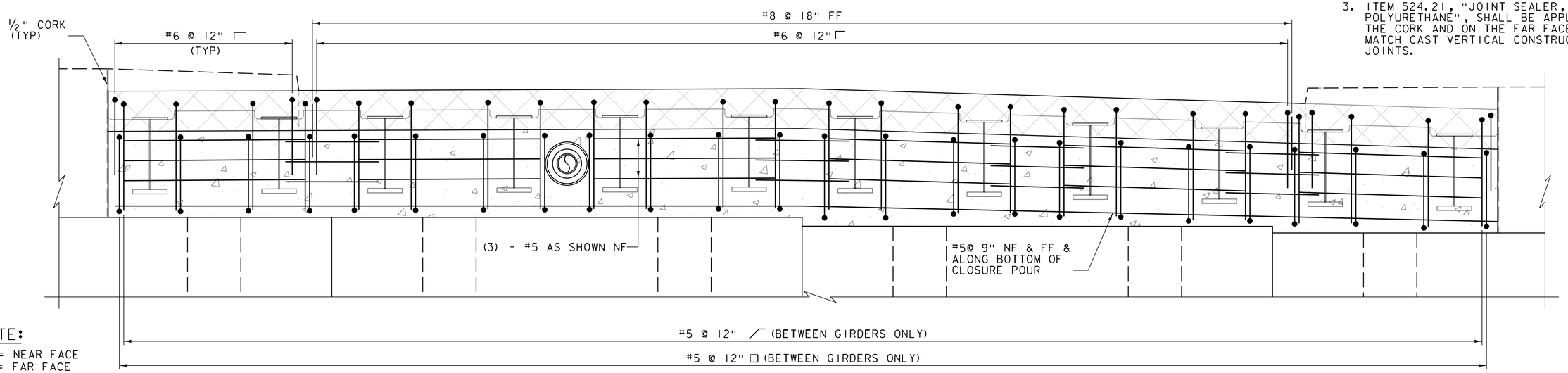
VHB 57435



ABUTMENT NO. 1
DECK CLOSURE POUR REINFORCING PLAN
SCALE ½" = 1'-0"

NOTES:

1. ABUTMENT NO. 1 REINFORCING SHOWN. ABUTMENT NO. 2 REINFORCING SIMILAR.
2. SEE GIRDER DETAILS SHEET FOR ADDITIONAL REINFORCING IN THE CLOSURE POUR.
3. ITEM 524.21, "JOINT SEALER, POLYURETHANE", SHALL BE APPLIED OVER THE CORK AND ON THE FAR FACE OF THE MATCH CAST VERTICAL CONSTRUCTION JOINTS.



NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

SPECIAL PROVISION (ULTRA HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

ABUTMENT NO. 1
DECK CLOSURE POUR REINFORCING ELEVATION
SCALE ½" = 1'-0"

vhb

PROJECT NAME: LUDLOW	
PROJECT NUMBER: BRF 025-1(42)	
FILE NAME: z10J068sub.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
ABUTMENT CLOSURE POUR	SHEET 47 OF 73

VHB 57435

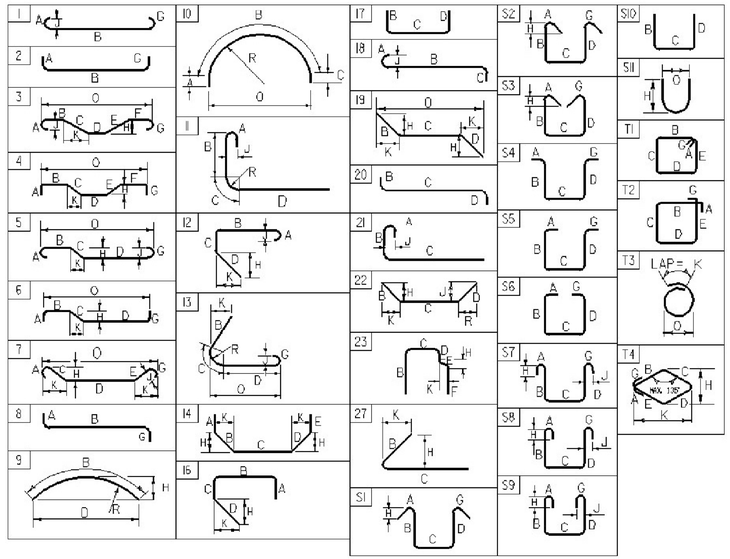
STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
WINGWALL NO. 1																	
	26	5	7'- 4"	1W501.3	17		2'- 2"	3'- 0"	2'- 2"								
	2	5	7'- 7"	1W502.3	17		2'- 2"	3'- 3"	2'- 2"								
	2	5	7'- 11"	1W503.3	17		2'- 2"	3'- 7"	2'- 2"								
	6	5	6'- 8"	1W504.3	22		1'- 6"	3'- 7"	1'- 6"				1'- 3"	1'- 3"	0'- 10"	0'- -10"	
✳ ▲	30	5	5'- 0"	1W505.3	STR												
▲	11	5	14'- 3"	1W506.3	STR												
▲	7	5	14'- 6"	1W507.3	19		4'- 5"	10'- 1"	-- --				1'- 0"		4'- 4"		14'- 4"
	27	7	5'- 0"	1W701.3	STR												
	11	8	12'- 0"	1W801.3	STR												
WINGWALL NO. 2																	
▲	23	5	7'- 4"	2W501.3	17		2'- 2"	3'- 0"	2'- 2"								
	2	5	7'- 7"	2W502.3	17		2'- 2"	3'- 3"	2'- 2"								
	2	5	7'- 11"	2W503.3	17		2'- 2"	3'- 7"	2'- 2"								
	6	5	6'- 7"	2W504.3	22		1'- 6"	3'- 7"	1'- 6"				1'- 3"	1'- 3"	0'- 10"	0'- -10"	
▲	23	5	5'- 1"	2W505.3	STR												
✳ ▲	12	5	11'- 0"	2W506.3	STR												
▲	7	5	14'- 3"	2W507.3	19		3'- 5"	10'- 10"	-- --				1'- 5"		3'- 1"		14'- 3"
✳	30	7	5'- 1"	2W701.3	STR												
	11	8	13'- 4"	2W801.3	STR												
WINGWALL NO. 3																	
	24	5	7'- 4"	3W501.3	17		2'- 2"	3'- 0"	2'- 2"								
	2	5	7'- 7"	3W502.3	17		2'- 2"	3'- 3"	2'- 2"								
	2	5	7'- 11"	3W503.3	17		2'- 2"	3'- 7"	2'- 2"								
	6	5	6'- 7"	3W504.3	22		1'- 6"	3'- 7"	1'- 6"				1'- 3"	1'- 3"	0'- 10"	0'- -10"	
✳ ▲	23	5	5'- 1"	3W505.3	STR												
▲	11	5	11'- 0"	3W506.3	STR												
▲	7	5	13'- 5"	3W507.3	19		3'- 6"	9'- 11"	-- --				0'- 8"		3'- 5"		13'- 5"
	30	7	5'- 1"	3W701.3	STR												
	11	8	13'- 4"	3W801.3	STR												
WINGWALL NO. 4																	
	25	5	7'- 4"	4W501.3	17		2'- 2"	3'- 0"	2'- 2"								
	2	5	7'- 7"	4W502.3	17		2'- 2"	3'- 3"	2'- 2"								
	2	5	7'- 11"	4W503.3	17		2'- 2"	3'- 7"	2'- 2"								
	6	5	6'- 8"	4W504.3	22		1'- 6"	3'- 7"	1'- 6"				1'- 3"	1'- 3"	0'- 10"	0'- -10"	
	30	5	5'- 0"	4W505.3	STR												
✳ ▲	12	5	14'- 3"	4W506.3	STR												
▲	7	5	14'- 6"	4W507.3	19		4'- 4"	10'- 2"	-- --				1'- 2"		4'- 1"		14'- 3"
▲	27	7	5'- 0"	4W701.3	STR												
✳	11	8	12'- 0"	4W801.3	STR												
SIDEWALK																	
✳	332	4	8'- 0"	SW401.3	S5	1'- 6"	2'- 0"	0'- 7"	2'- 5"			1'- 6"					
	42	5	40'- 0"	SW501.3	STR												

~ NOTES ~

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31 (ASTM A 615-SI). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE. OTHERWISE, STANDARD HOOKS ARE TO BE USED.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.
8. ▲ DENOTES BARS TO BE CUT IN FIELD.
9. ✳ DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.
10. △ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.
11. E IN BAR MARK PREFIX DENOTES EPOXY COATED REINFORCING STEEL.



ASTM STANDARD REINFORCING BARS

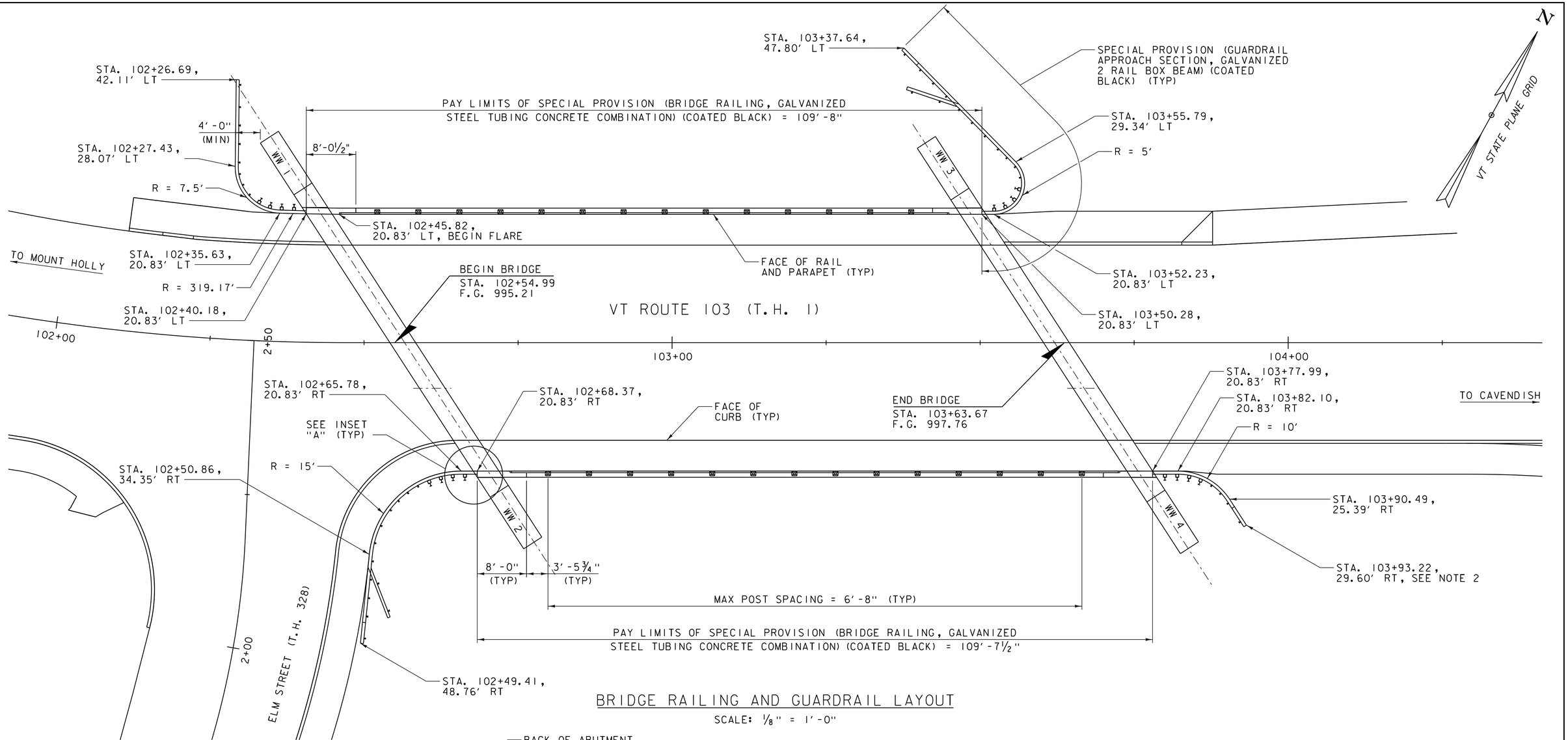
BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES ^{2}	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

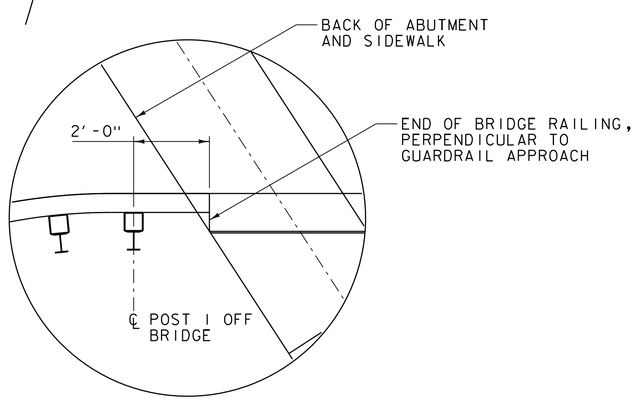
FILE NAME: z10j068rss.dgn
PROJECT MANAGER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
REINFORCING STEEL SCHEDULE SHEET #1

PLOT DATE: 5/11/2016
DRAWN BY: E.F. LAWES
CHECKED BY: R.H. BARNES
SHEET 48 OF 73



BRIDGE RAILING AND GUARDRAIL LAYOUT

SCALE: ⅛" = 1'-0"



INSET "A"

NOT TO SCALE

NOTES:

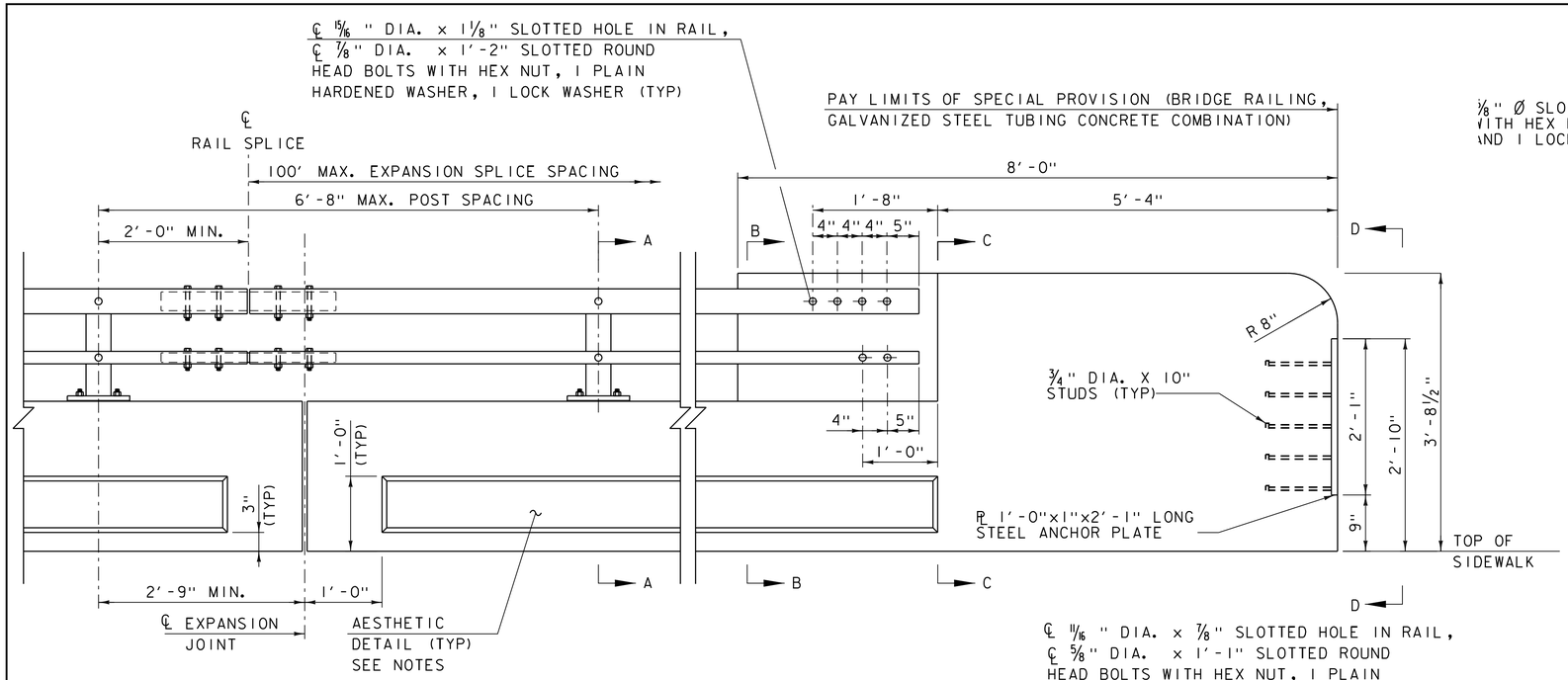
1. SEE BRIDGE RAIL DETAILS SHEETS AND STANDARD G-1bM FOR FURTHER DETAILS.
2. GUARDRAIL APPROACH SECTION AT SOUTHEAST APPROACH SHALL BE MODIFIED TO BE SHORTER, SEE BRIDGE RAIL DETAILS SHEETS FOR FURTHER DETAILS.
3. ALL DIMENSIONS ARE MEASURED ALONG THE BACK FACE OF RAIL (CENTER TO CENTER POST SPACINGS).
4. APPROACH RAIL TO BE SHOP BENT FOR ALL RADII.
5. THE EXPANSION JOINT SHALL BE LOCATED A MINIMUM OF 25'-0" FROM EITHER END OF THE BRIDGE RAIL LIMITS.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

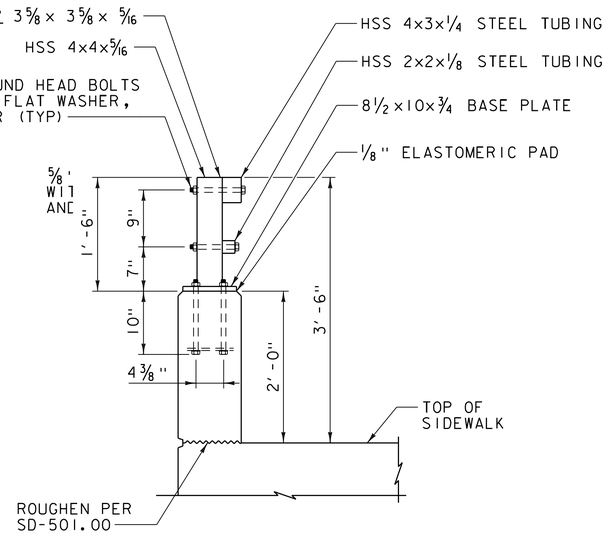
FILE NAME: z101068brail.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: R.H. BARNES
BRIDGE RAILING AND GUARDRAIL LAYOUT

PLOT DATE: 8/23/2016
DRAWN BY: R.H. BARNES
CHECKED BY: E.F. LAWES
SHEET 49 OF 73

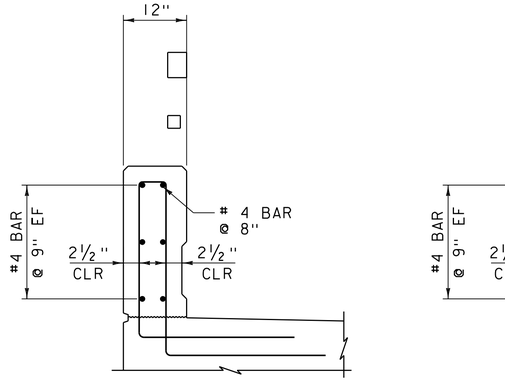
VHB 57435



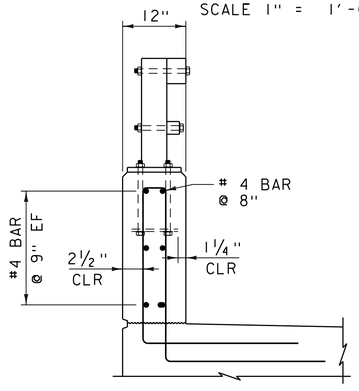
RAILING & END WALL APPROACH
SCALE 1" = 1'-0"



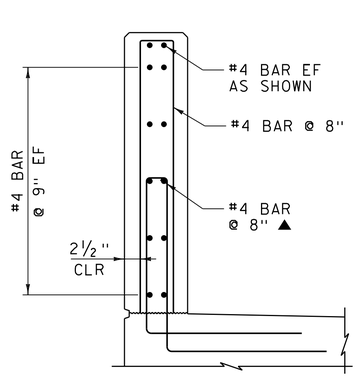
RAIL TYPICAL SECTION
SCALE 1" = 1'-0"



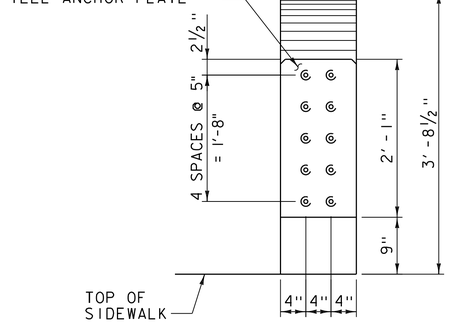
SECTION A-A
NOT TO SCALE



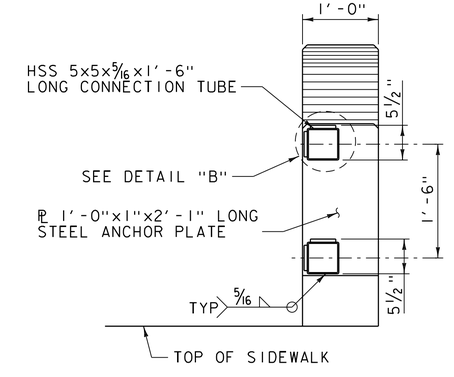
SECTION B-B
NOT TO SCALE



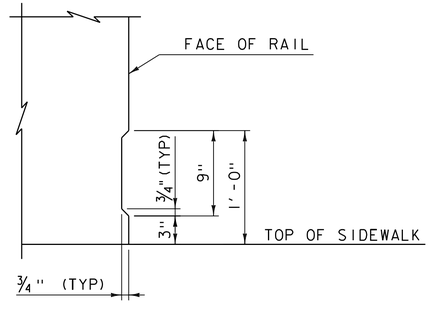
SECTION C-C
NOT TO SCALE



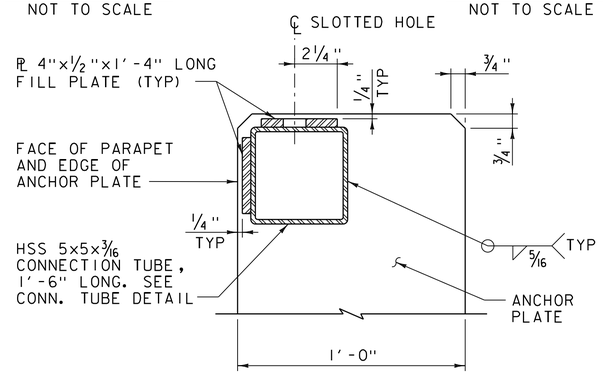
SHOWING EMBEDDED STUDS



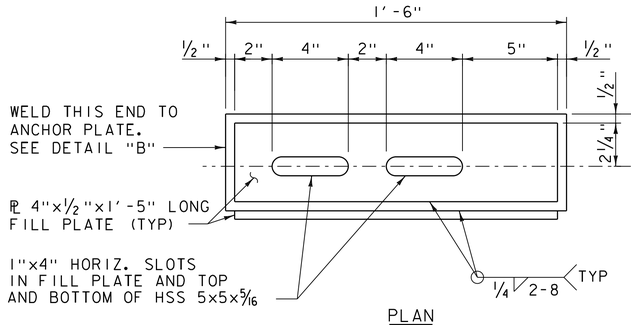
WITH HSS CONNECTOR TUBE



AESTHETIC TREATMENT DETAIL
SCALE 1 1/2" = 1'-0"



DETAIL B
SCALE 3" = 1'-0"



PLAN

CONNECTION TUBE DETAIL
SCALE 3" = 1'-0"

VIEW D-D

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

NOTES:

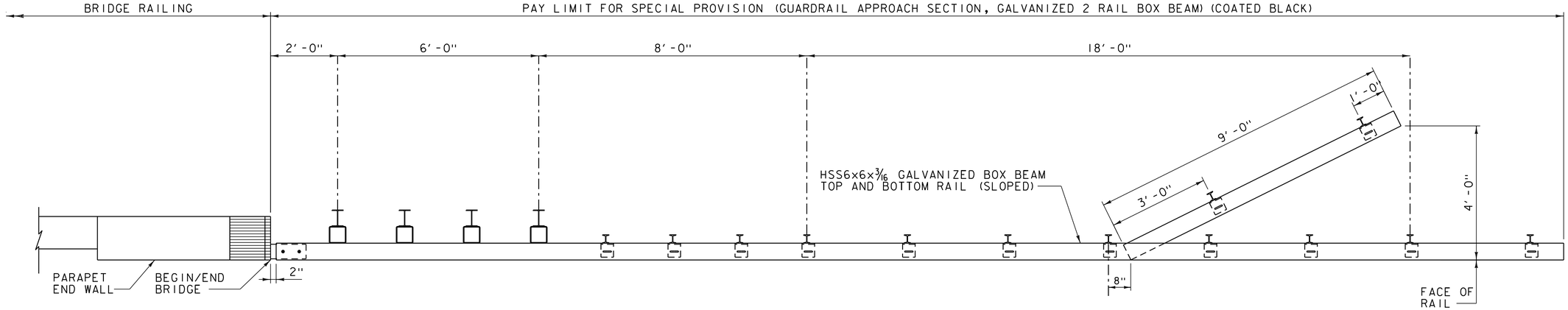
1. SEE STANDARDS S-352B AND S-352C FOR STEEL TUBING SPLICE DETAILS AND RAIL POST BASE PLATE DETAILS.
2. THIS RAILING MEETS THE REQUIREMENTS FOR NCHRP REPORT 350 TL-4 SERVICE LEVEL.
3. ALL EXPOSED STEEL COMPONENTS TO BE PAINTED BLACK.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068brail_dt.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: S.E. BURBANK
BRIDGE RAIL DETAILS (1 OF 4)

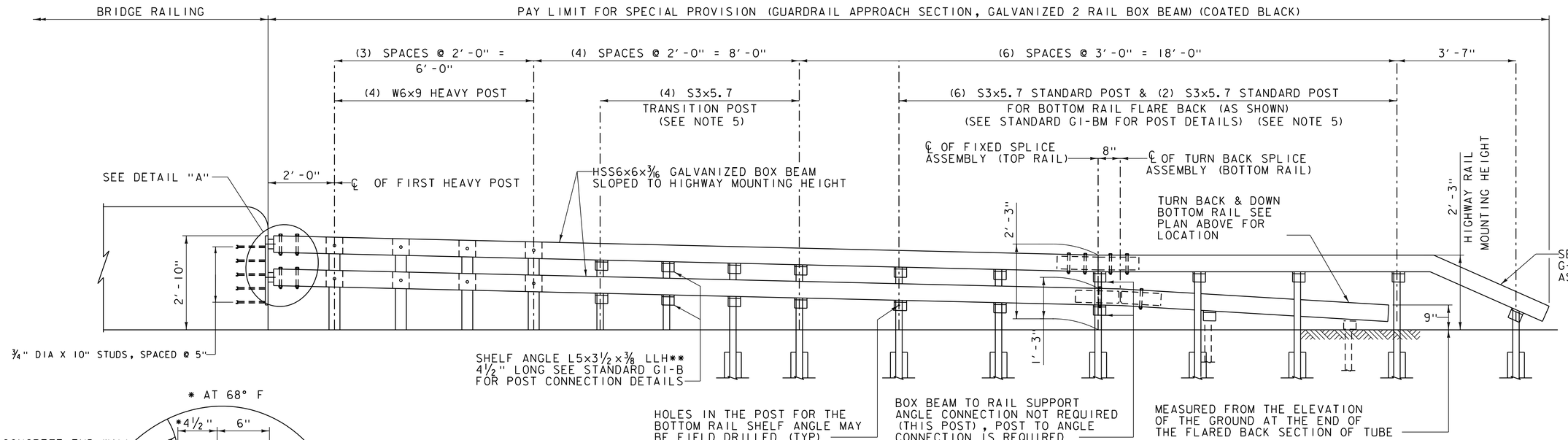
PLOT DATE: 8/23/2016
DRAWN BY: J.L. LEMIEUX
CHECKED BY: A.P. GUYETTE
SHEET 50 OF 73

VHB 57435



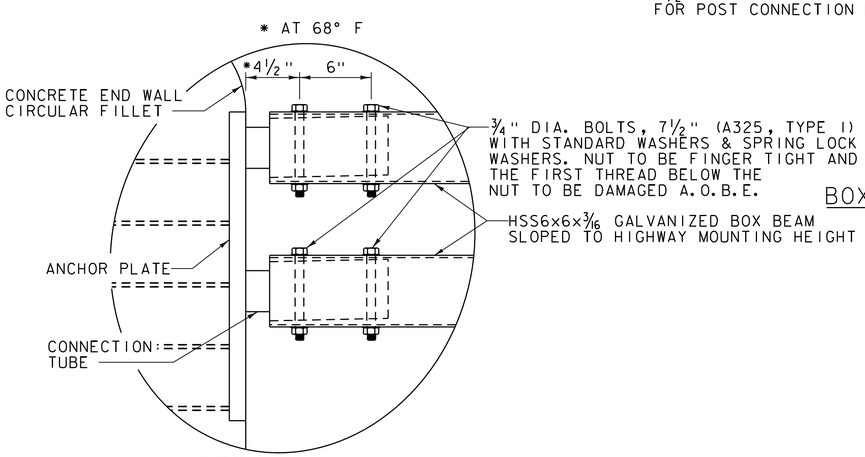
BOX BEAM APPROACH RAILING PLAN VIEW

N.T.S.



BOX BEAM APPROACH RAILING ELEVATION

N.T.S.



DETAIL "A"

N.T.S.

**LONG LEG HORIZONTAL

NOTES:

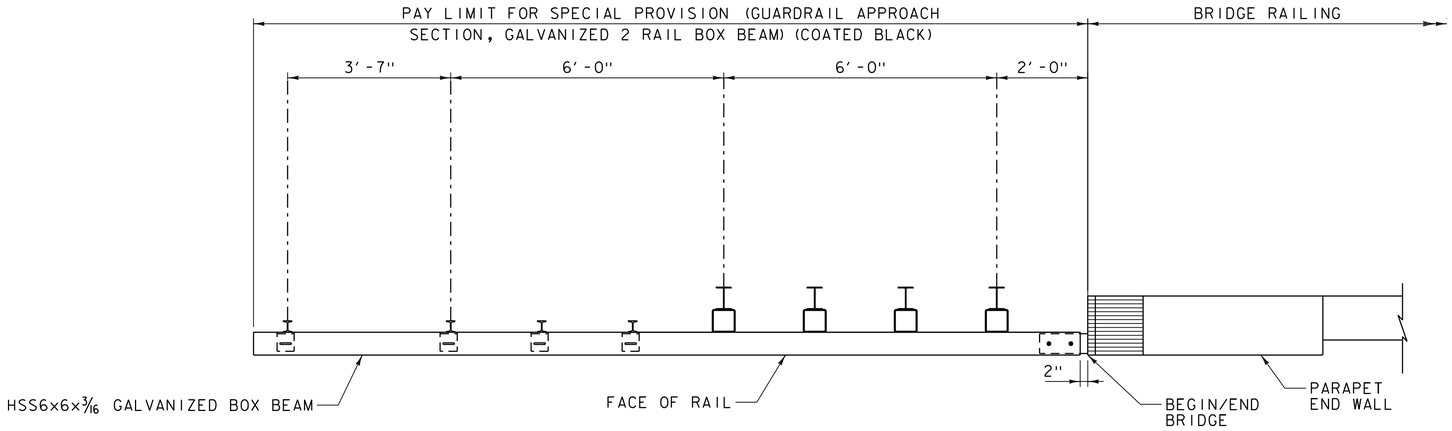
1. ALL STEEL COMPONENTS TO BE PAINTED BLACK.
2. SEE STANDARDS S-364C AND S-364D FOR FIXED SPLICE AND POST DETAILS.
3. SEE STANDARD G-1Bm FOR BOX BEAM RAIL AND POST DETAILS.
4. SEE BRIDGE RAIL DETAILS SHEET (1 OF 4) FOR ANCHOR PLATE AND CONNECTION TUBE DETAILS.
5. S3x5.7 SHALL MEET THE REQUIREMENTS OF 728.01(c).
6. RAILS ARE SHOWN STRAIGHT FOR CLARITY.

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068brail_dt.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: S.E. BURBANK
BRIDGE RAIL DETAILS (2 OF 4)

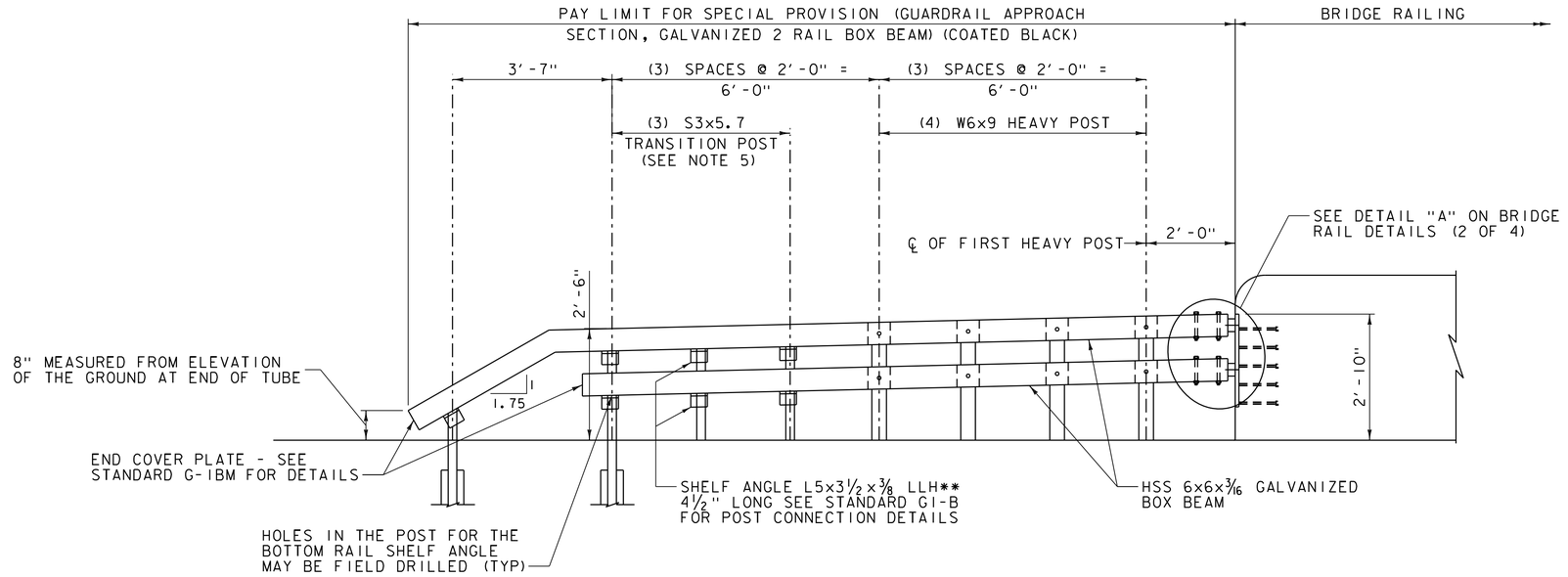
PLOT DATE: 8/23/2016
DRAWN BY: R.H. BARNES
CHECKED BY: A.P. GUYETTE
SHEET 51 OF 73

VHB 57435



BOX BEAM APPROACH RAILING PLAN VIEW (SOUTHEAST APPROACH)

N.T.S.



BOX BEAM APPROACH RAILING ELEVATION (SOUTHEAST APPROACH)

N.T.S.

**LONG LEG HORIZONTAL

NOTES:

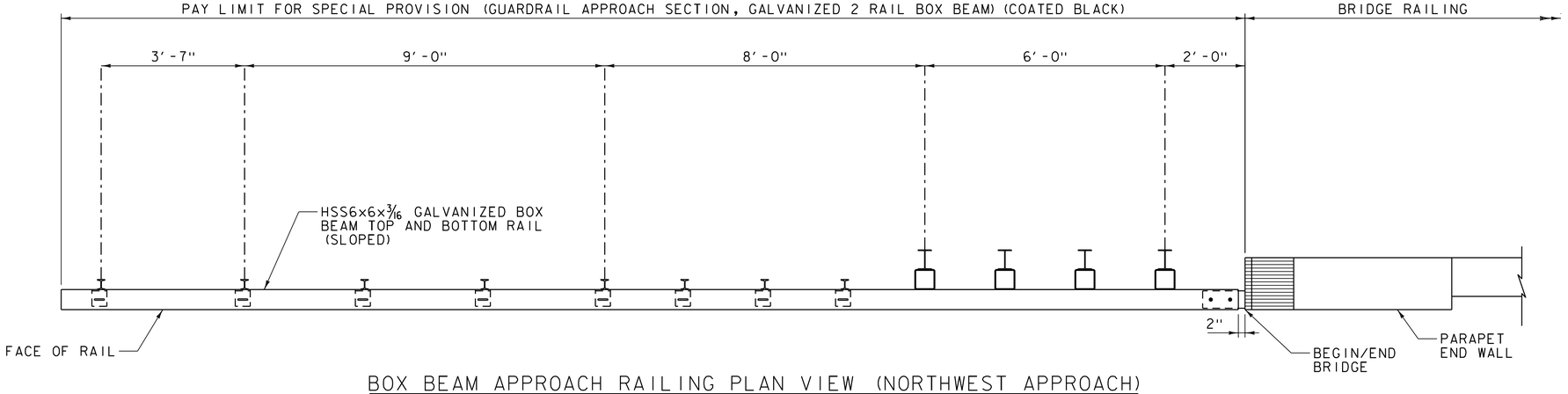
1. ALL STEEL COMPONENTS TO BE PAINTED BLACK.
2. APPROACH RAIL TO BE SHOP BENT.
3. SEE BRIDGE RAIL DETAILS SHEET (1 OF 4) FOR ADDITIONAL DETAILS.
4. RAILS ARE SHOWN STRAIGHT FOR CLARITY.
5. S3x5.7 SHALL MEET THE REQUIREMENTS OF 728.01(c).

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068brail_dt.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: S.E. BURBANK
BRIDGE RAIL DETAILS (3 OF 4)

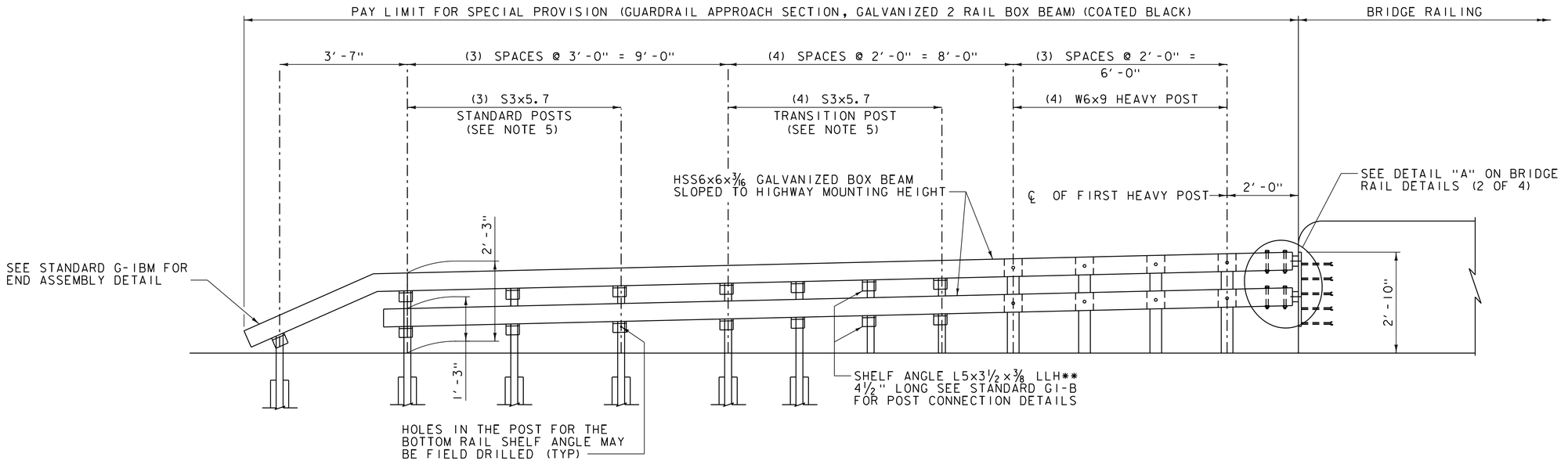
PLOT DATE: 8/23/2016
DRAWN BY: R.H. BARNES
CHECKED BY: A.P. GUYETTE
SHEET 52 OF 73

VHB 57435



BOX BEAM APPROACH RAILING PLAN VIEW (NORTHWEST APPROACH)

N.T.S.



BOX BEAM APPROACH RAILING ELEVATION (NORTHWEST APPROACH)

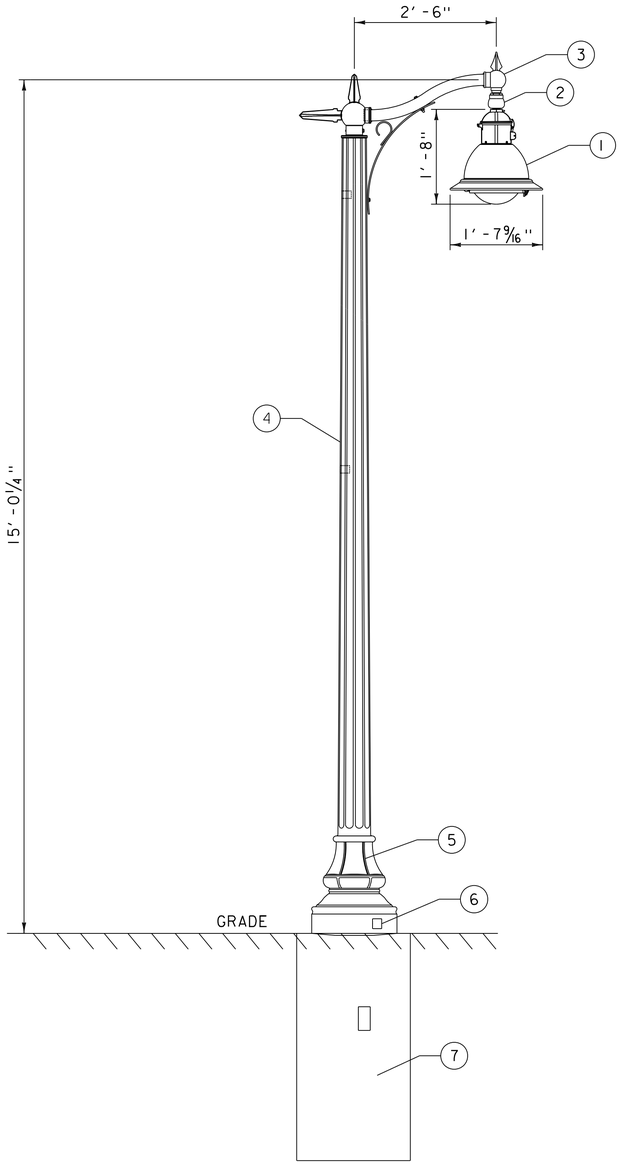
N.T.S.

**LONG LEG HORIZONTAL

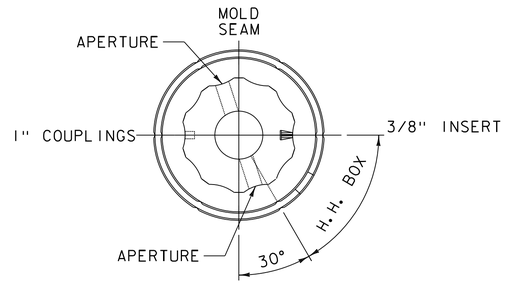
NOTES:

1. ALL STEEL COMPONENTS TO BE PAINTED BLACK.
2. APPROACH RAIL TO BE SHOP BENT.
3. SEE BRIDGE RAIL DETAILS SHEET (1 OF 4) FOR ADDITIONAL DETAILS.
4. RAILS ARE SHOWN STRAIGHT FOR CLARITY.
5. S3x5.7 SHALL MEET THE REQUIREMENTS OF 728.01(c).

PROJECT NAME: LUDLOW	
PROJECT NUMBER: BRF 025-1(42)	
FILE NAME: z10j068brail_dt.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: R.H. BARNES
DESIGNED BY: S.E. BURBANK	CHECKED BY: A.P. GUYETTE
BRIDGE RAIL DETAILS (4 OF 4)	SHEET 53 OF 73



LUMINAIRE
NOT TO SCALE



TOP VIEW

DESCRIPTION OF COMPONENTS:

1. LUMINAIRE: KING LUMINAIRE, CATALOGUE NO.: K729-P4SA-III-60(SSL)-7030-120:277V-KPL20.

   QUANTITY: 4 EA.

   OPTICAL SYSTEM: FLAT ARRAY, SAG LENS.

   IES CLASS: TYPE III.

   WATTAGE: 60W (7030 SERIES).

   LAMP: FLAT LED ARRAY (INCLUDED).

   CCT/DIODE: 4000K/HE5.

   LIGHT SOURCE: SOLID STATE LIGHTING.

   LINE VOLTAGE: 120:277V.

   PAINT: FOREST GREEN (MATCH EXISTING COLOR).

   OPTIONS: KPL-20 LEVELING DEVICE.

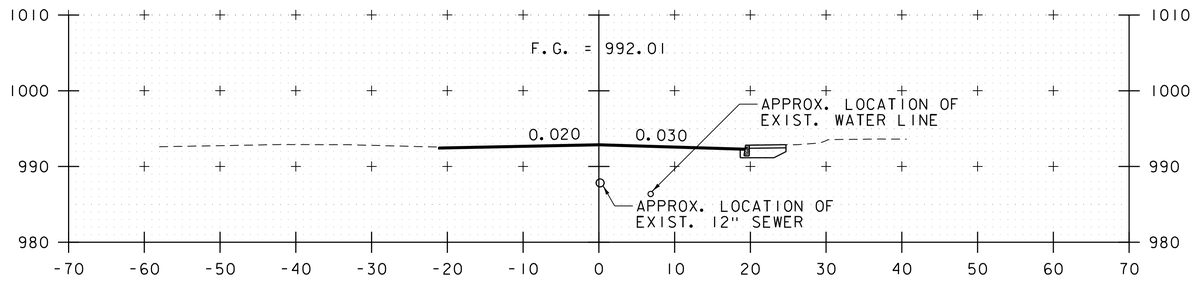
2. KPL10 LEVELING DEVICE (EXISTING) .
3. MODIFIED KA40-T-1 MINI-SCROLL ARM C/W DECORATIVE SCROLL (EXISTING).
4. POLE: KWC14-G-E51 C/W 140-25/30 S/F BA WASHINGTON COACHMAN SPUN CONCRETE POLE (EXISTING).
5. H.H. BOX AND COVERPLATE C/W GROUNDWIRE & ALLENHEAD SCREWS.
6. STD. SMALL NAMEPLATE.
7. CONCRETE FOUNDATION: SHALL BE CONSTRUCTED IN ACCORDANCE WITH VTRANS STANDARD DRAWING T-133.

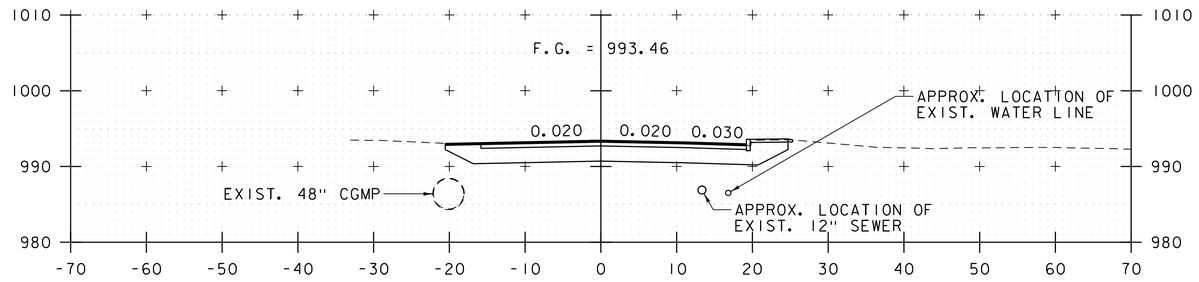
NOTES:

1. THE CONTRACTOR SHALL REMOVE AND STOCKPILE EXISTING STREET LIGHTING MATERIALS FROM THE BRIDGE SITE. EXISTING POLES, BRACKET ARMS, LEVELING DEVICES, AND LUMINAIRES SHALL BE REMOVED AND STORED IN A SECURE LOCATION.
2. THE TOWN OF LUDLOW WILL SUPPLY A FOURTH POLE, BRACKET ARM, AND LEVELING DEVICE TO THE CONRACTOR FOR USE ON THE PROJECT.
3. EXISTING POLES, SCROLLL ARMS, AND LEVELING DEVICES SHALL BE RESET AT THE LOCATIONS INDICATED IN THESE PLANS.
4. THE WORK TO REMOVE, STOCKPILE, AND RESET LIGHTING ELEMENTS SHALL BE PAID FOR UNDER ITEM 679.25, REMOVING AND RESETTING LIGHT POLE.
5. NEW LIGHT POLE FOUNDATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH VTRANS STANDARD DRAWING T-133. PAYMENT FOR EXCAVATION, BACKFILL, ANCHOR BOLTS, AND CONSTRUCTION OF THE NEW CONCRETE LIGHT FOUNDATION SHALL INCLUDED UNDER ITEM 679.25, REMOVING AND RESETTING LIGHT POLE.
6. NEW LUMINARIES AS SPECIFIED IN THESE PLANS SHALL BE INSTALLED ON EACH LIGHT POLE. THE LUMINARES SHALL BE MANUFACTURED BY KING LUMINAIRE.
7. EXISTING LUMINARES SHALL BECOME THE PROPERTY OF THE TOWN OF LUDLOW, VT AND DELIVERY TO THE TOWN SHALL BE COORDINATED THROUGH THE TOWN MANAGER.
8. WIRING FOR THE LUMINAIRE SHALL EXTEND FROM THE LUMINAIRE TO THE BASE OF THE POLE. THE COST FOR THE WIRING SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM 679.50, LUMINAIRE.
9. WIRING FROM THE POWER SOURCE TO THE BASE OF THE POLE SHALL BE DESIGNED AND SPECIFIED BY A QUALIFIED ELECTRICIAN. THE COST FOR WIRING FROM THE POWER SOURCE TO THE BASED OF THE POLE SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM 678.23, WIRED CONDUIT.
10. ALL EXPOSED HARDWARE SHALL BE STAINLESS STEEL.

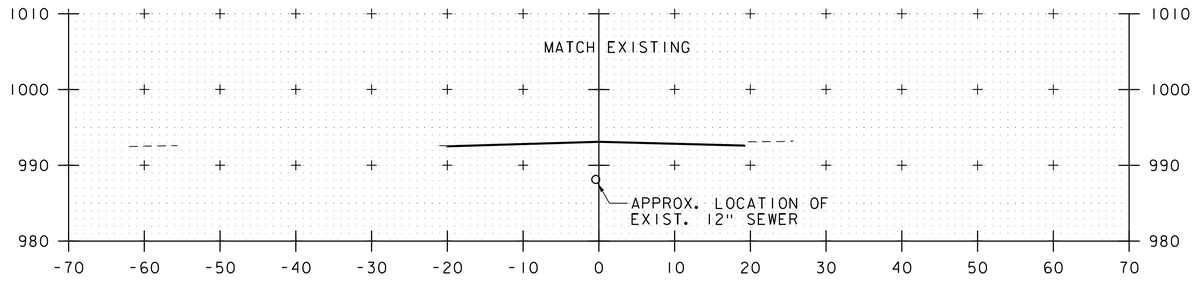
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068lighting.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: VHB
DESIGNED BY: STRESSCRETE GROUP	CHECKED BY: VHB
LIGHTING DETAILS	SHEET 54 OF 73

VHB 57435

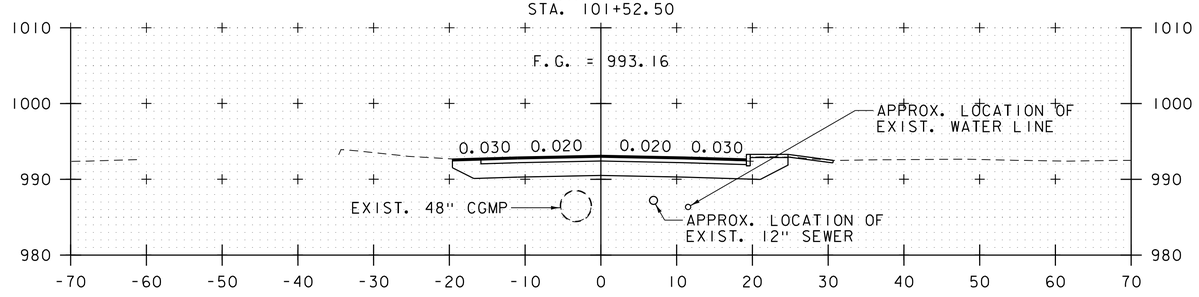




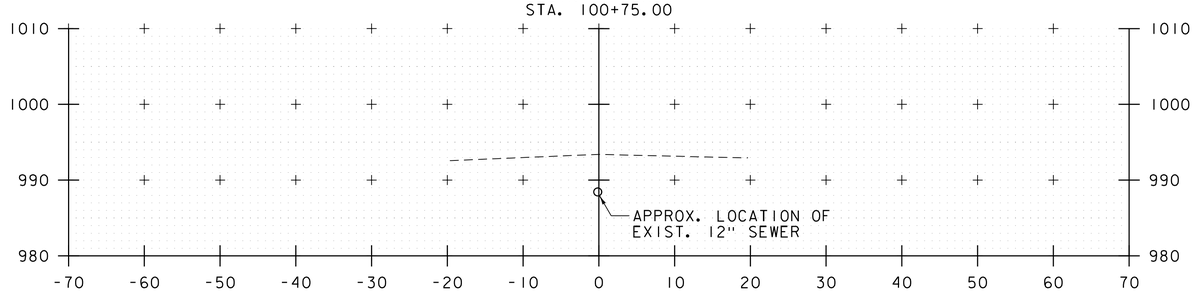
101+00



101+75
BEGIN PROJECT
STA. 101+52.50

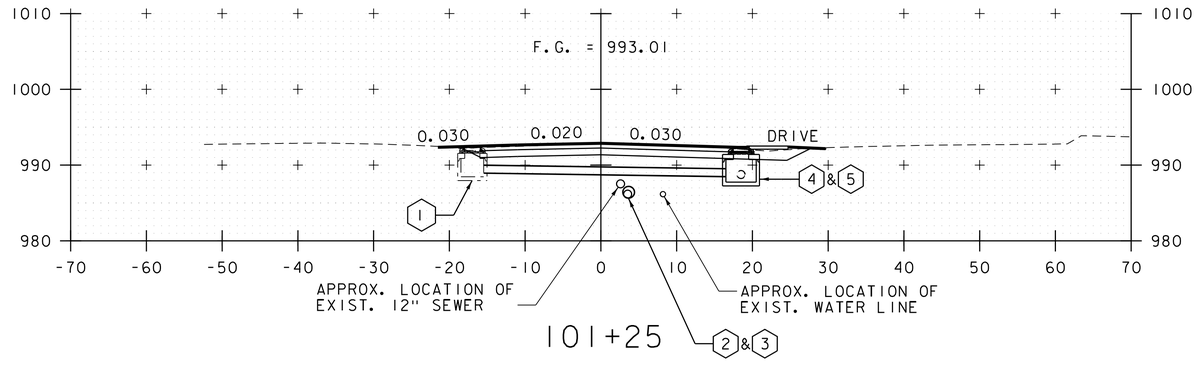


100+75
BEGIN APPROACH
STA. 100+75.00



100+50

101+50

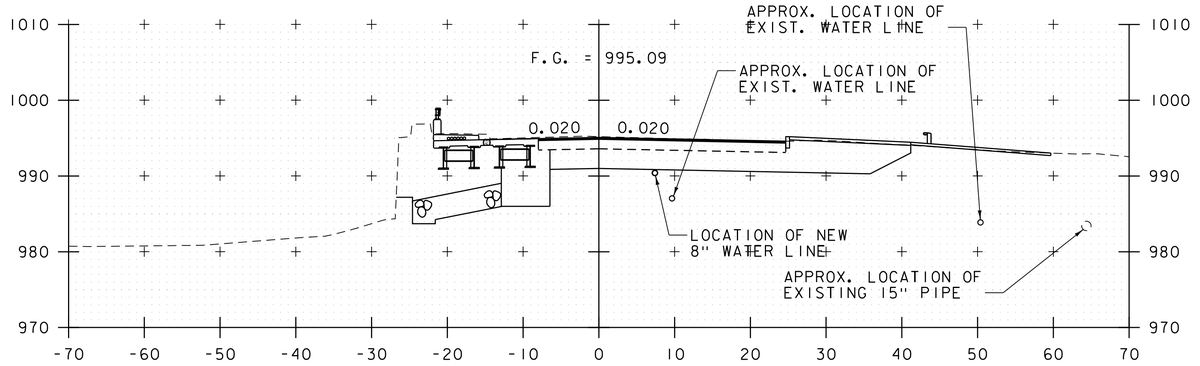


101+25

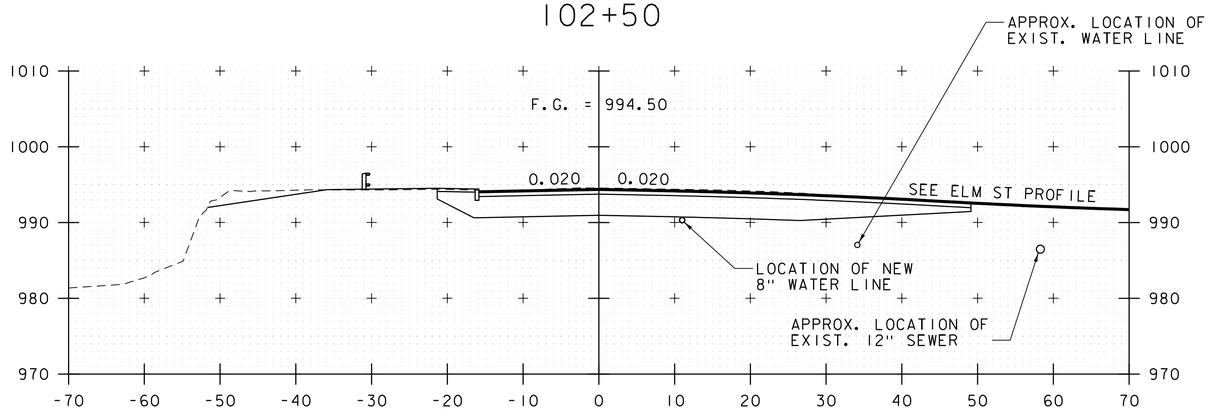
ROADWAY CROSS SECTIONS

STA. 100+50 - 101+75

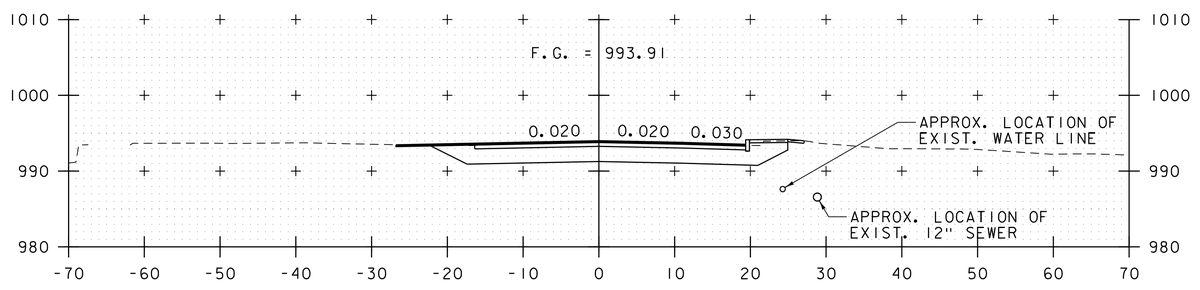
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z101068xsl.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
ROADWAY CROSS SECTIONS (1OF 4)	SHEET 55 OF 73



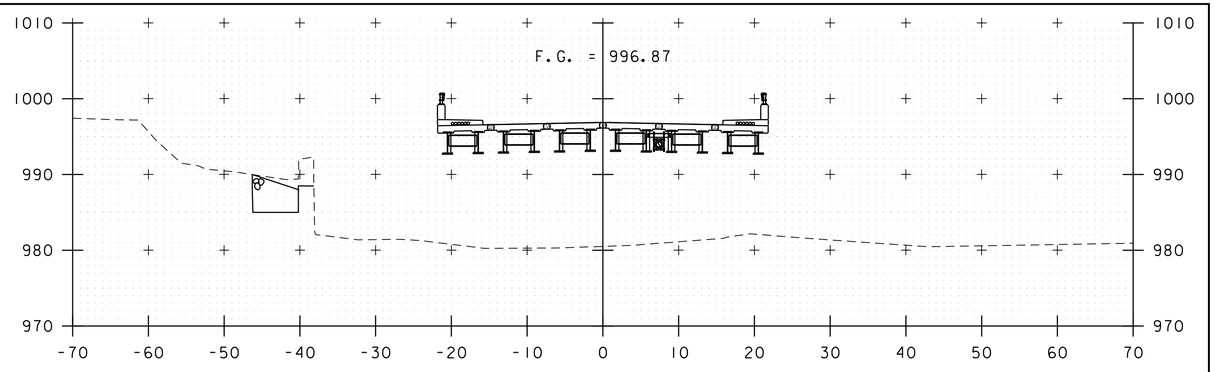
102+50



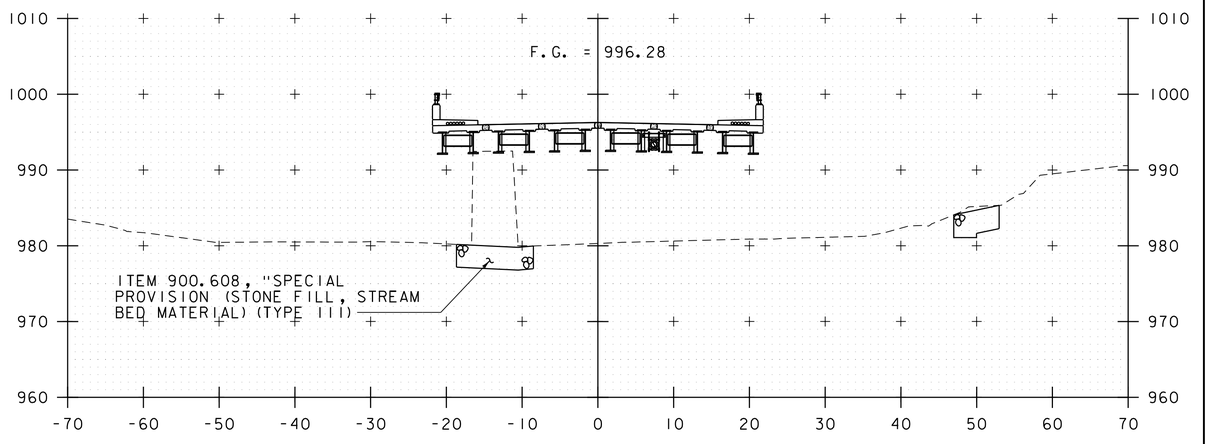
102+25



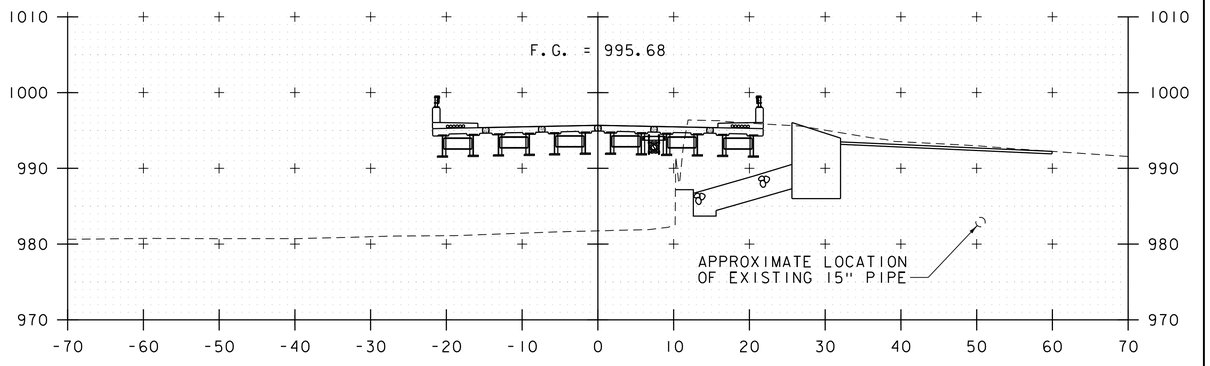
102+00



103+25



103+00



102+75
BEGIN BRIDGE
STA. 102+54.99

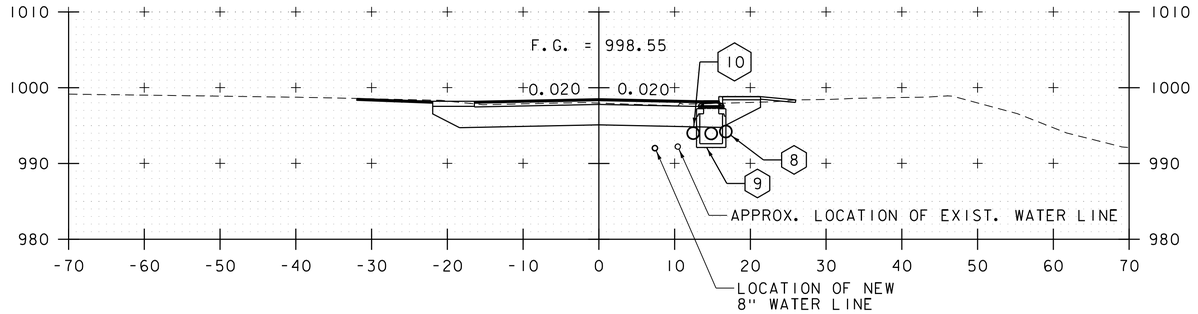
ROADWAY CROSS SECTIONS
STA. 102+00 - 103+25

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

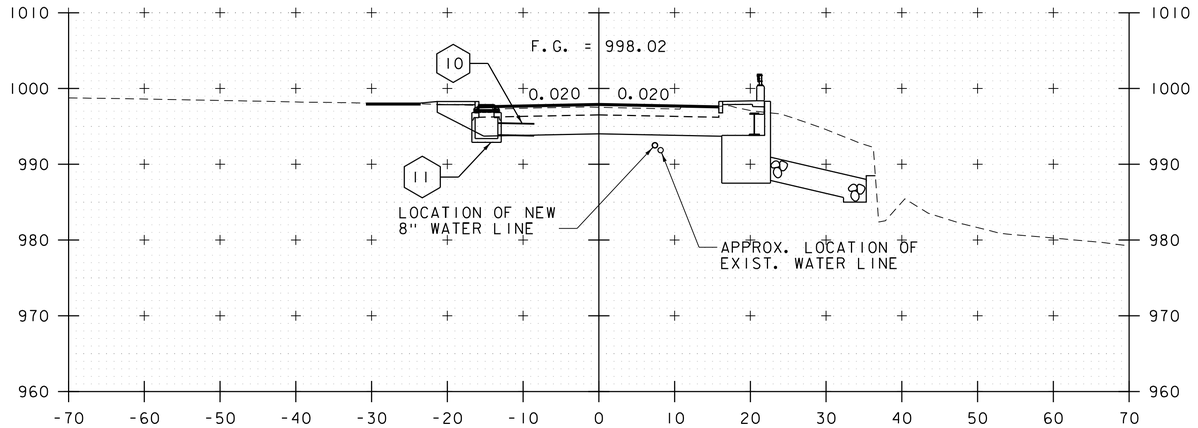
FILE NAME: z10j068xsl.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
ROADWAY CROSS SECTIONS (2 OF 4)

PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 56 OF 73

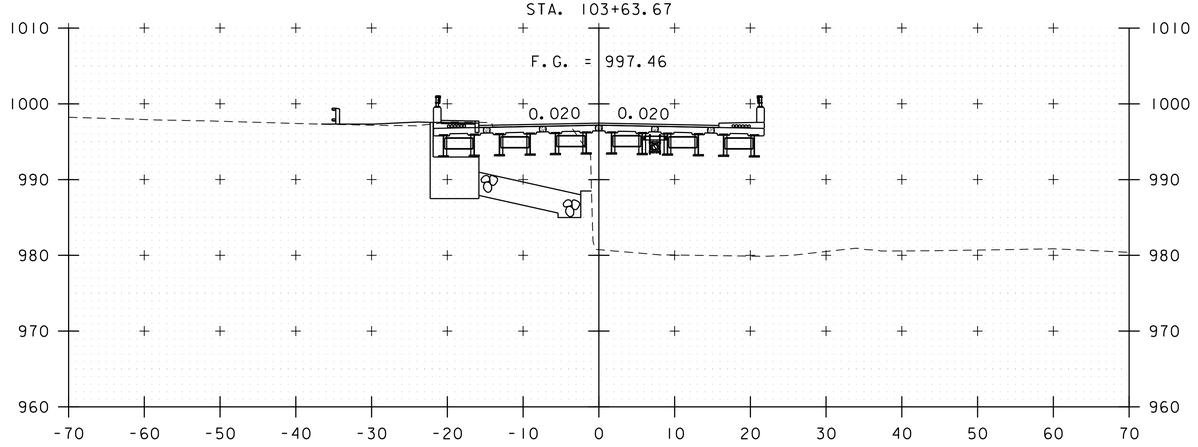
VHB 57435



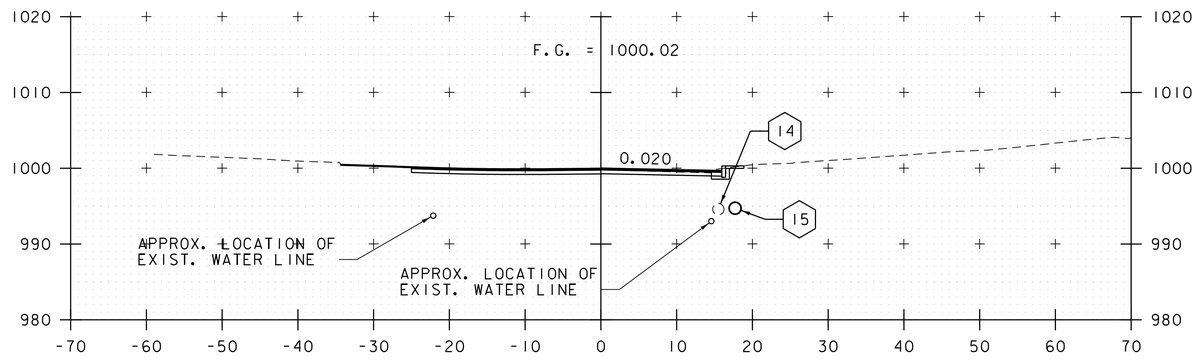
104+00



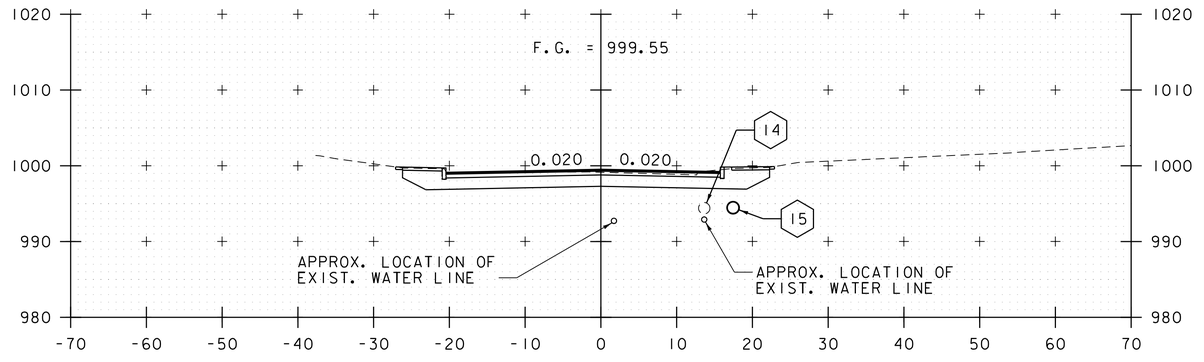
103+75
END BRIDGE
STA. 103+63.67



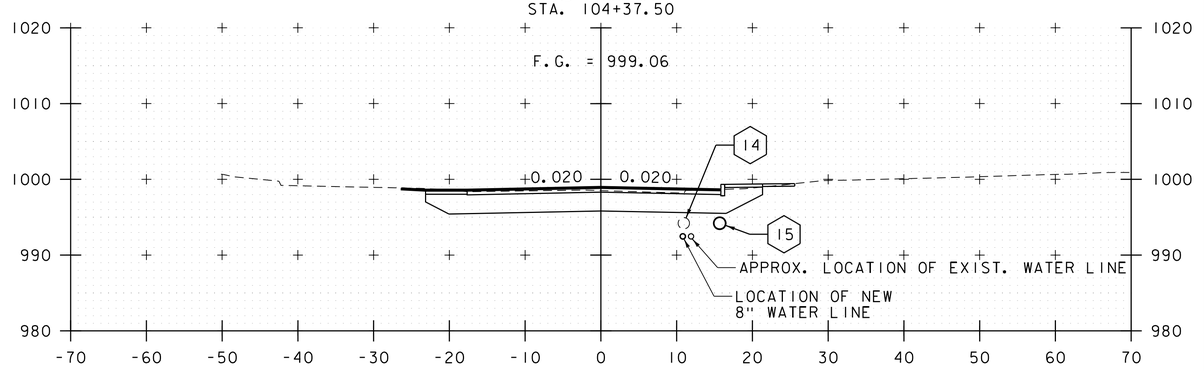
103+50



104+75



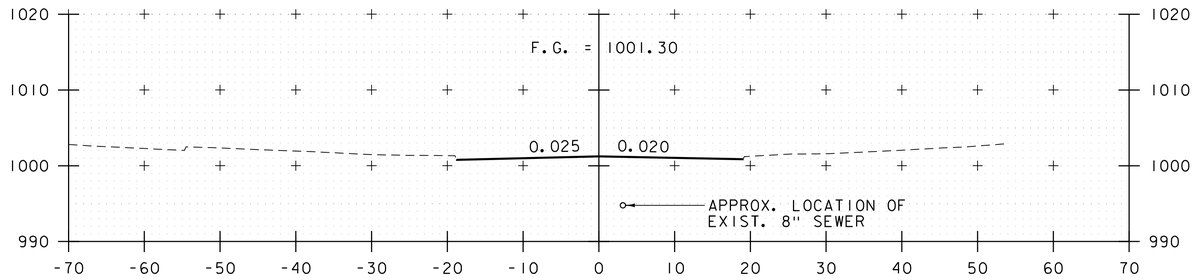
104+50
END PROJECT
STA. 104+37.50



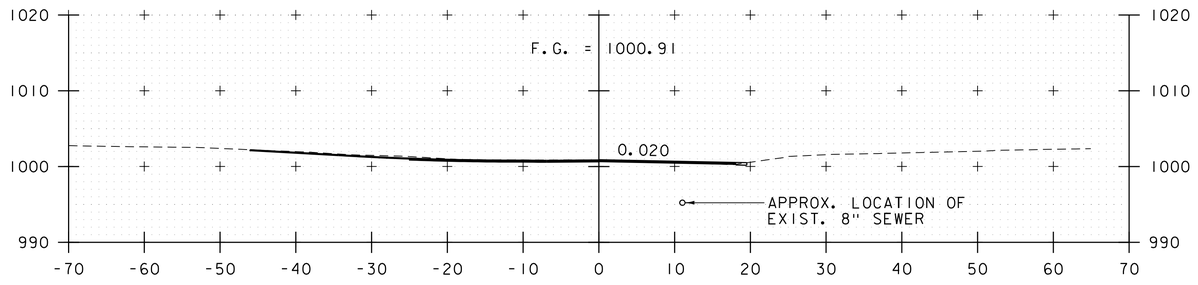
104+25

ROADWAY CROSS SECTIONS
STA. 103+50 - 104.75

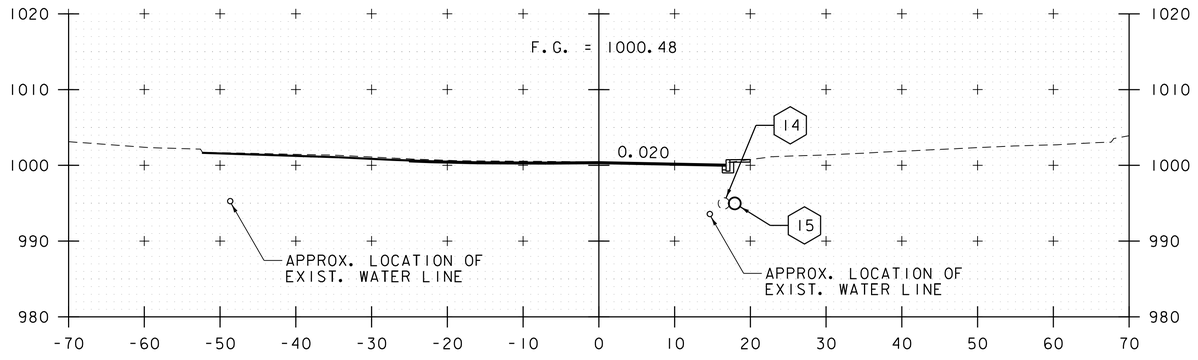
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068xsl.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.F. LAWES
DESIGNED BY: E.F. LAWES	CHECKED BY: A.P. GUYETTE
ROADWAY CROSS SECTIONS (3 OF 4)	SHEET 57 OF 73



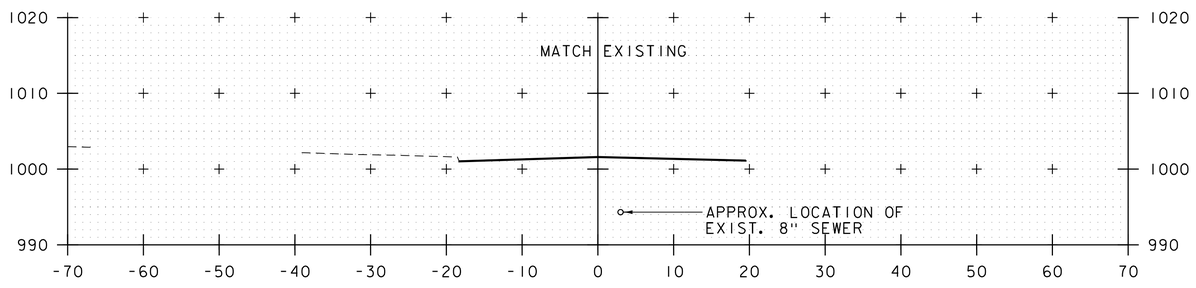
105+50



105+25



105+00



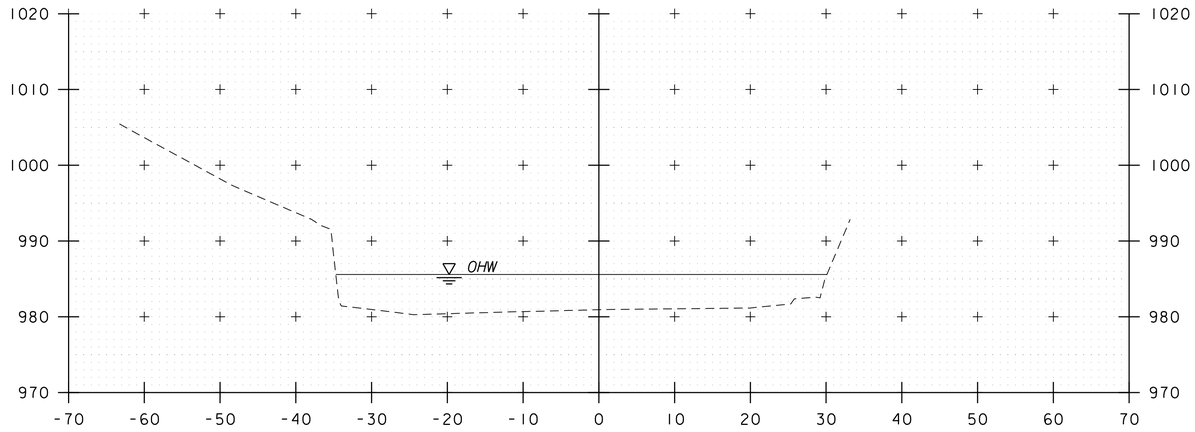
105+75
END APPROACH
STA. 105+75.00

ROADWAY CROSS SECTIONS
STA. 105+00 - 105+75

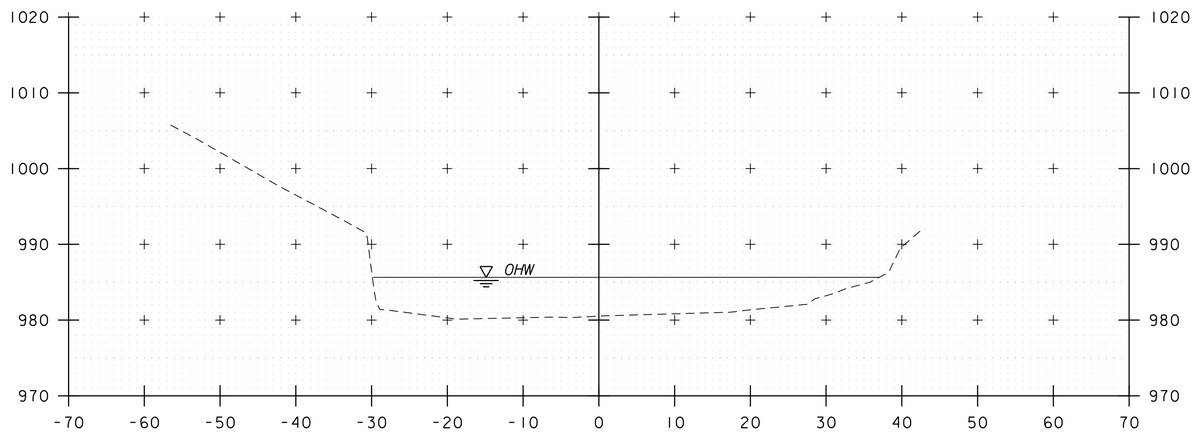
PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068xsl.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.F. LAWES
ROADWAY CROSS SECTIONS (4 OF 4)

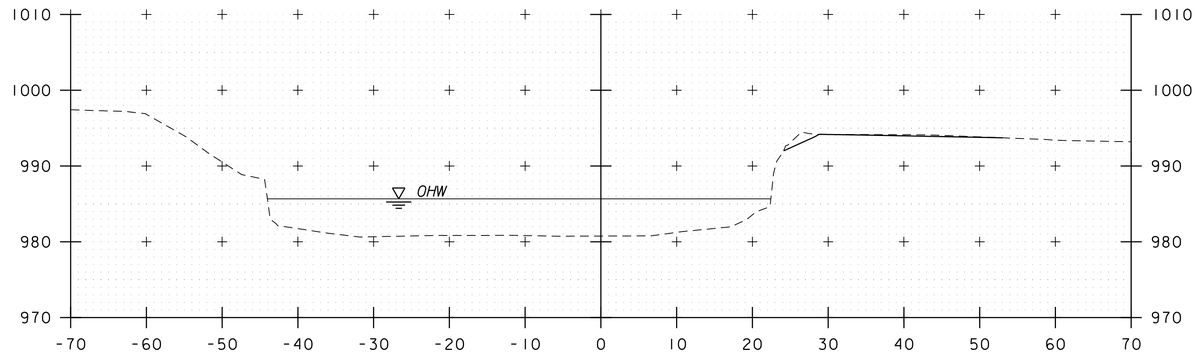
PLOT DATE: 8/23/2016
DRAWN BY: E.F. LAWES
CHECKED BY: A.P. GUYETTE
SHEET 58 OF 73



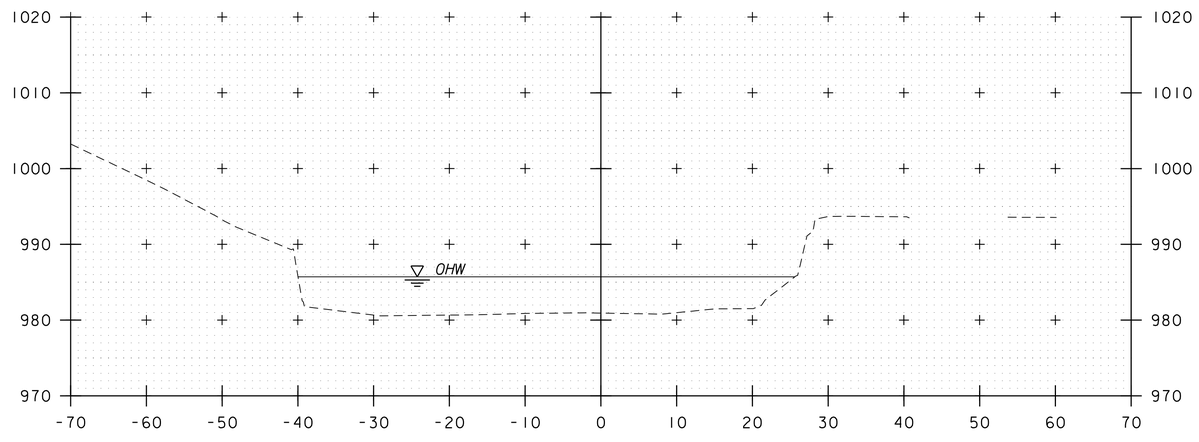
10+25



10+00



10+75



10+50

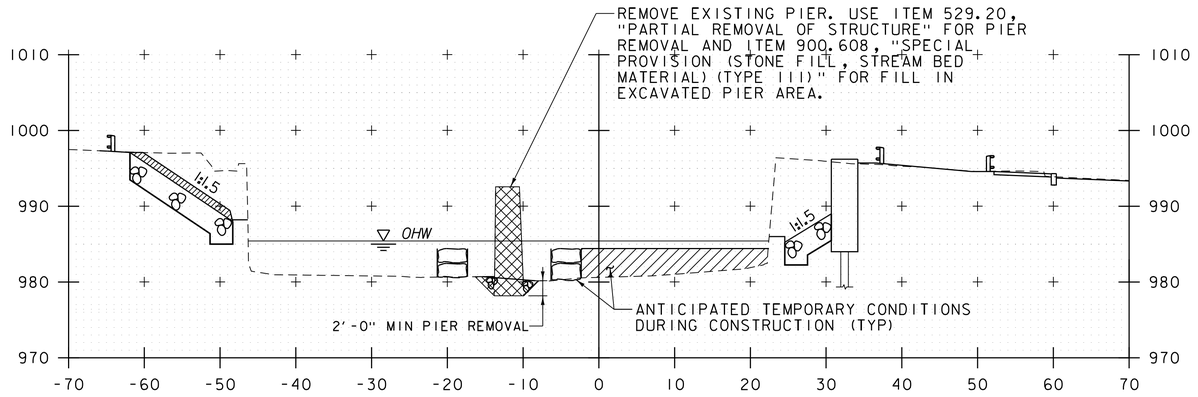
CHANNEL CROSS SECTIONS
STA. 10+00 TO 10+75

vhb

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)

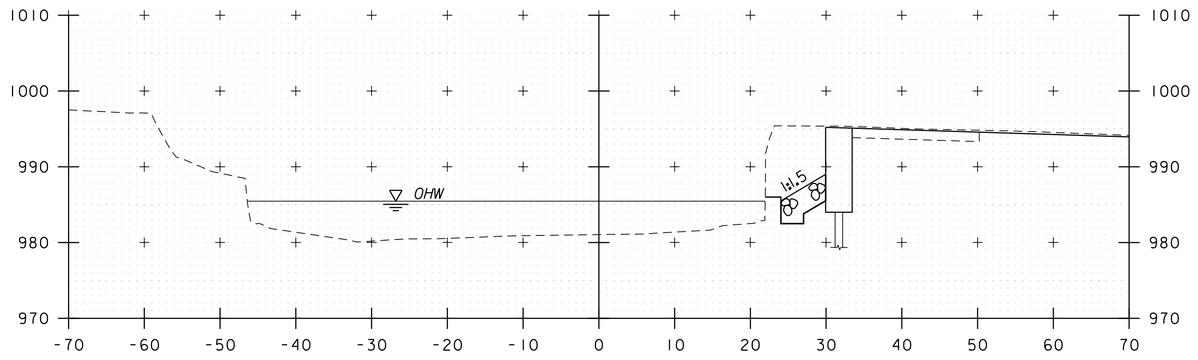
FILE NAME: z10j068xsl.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
CHANNEL CROSS SECTIONS (1 OF 3)	SHEET 59 OF 73

VHB 57435



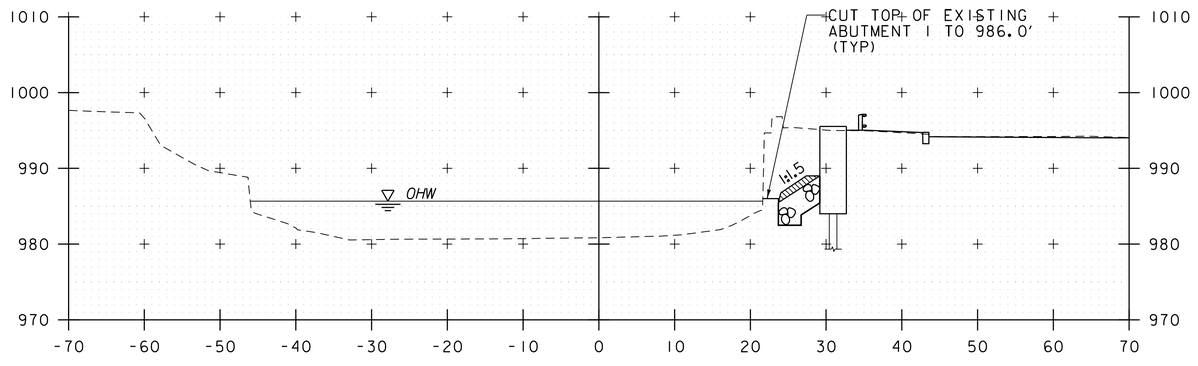
STA. 11+29, LT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

11+50



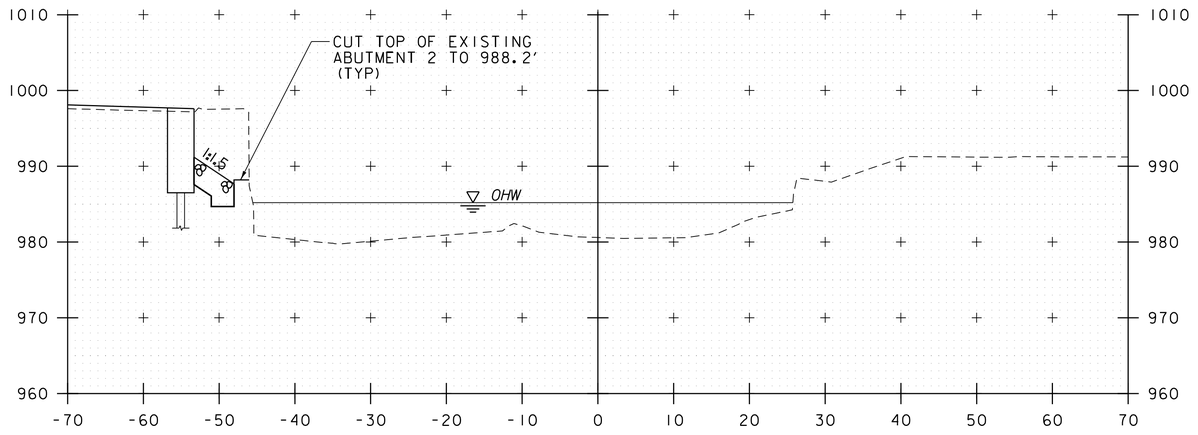
STA. 11+07, RT
END GRUBBING MATERIAL

11+25



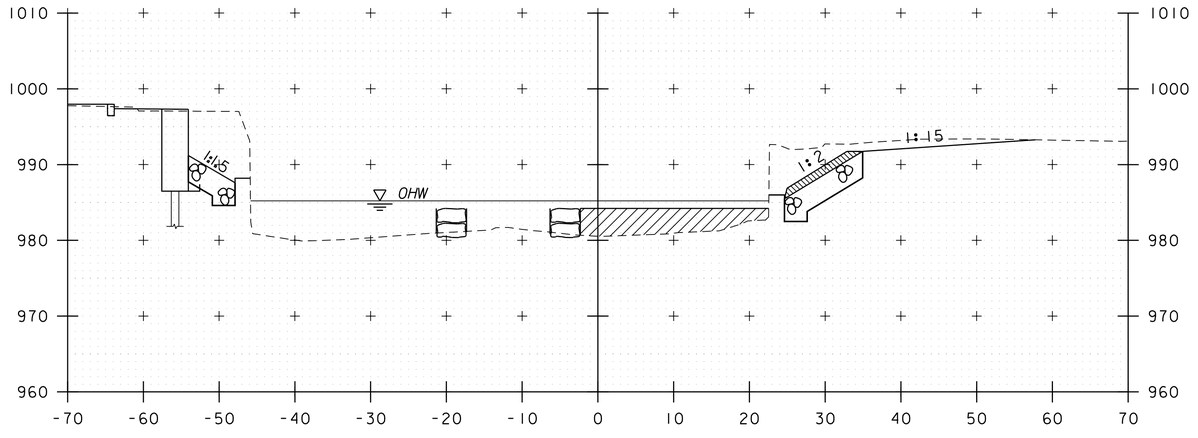
STA. 10+83, RT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

11+00



STA. 11+98, RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

12+00



STA. 11+61, LT
END GRUBBING MATERIAL

STA. 11+55, RT
BEGIN GRUBBING MATERIAL

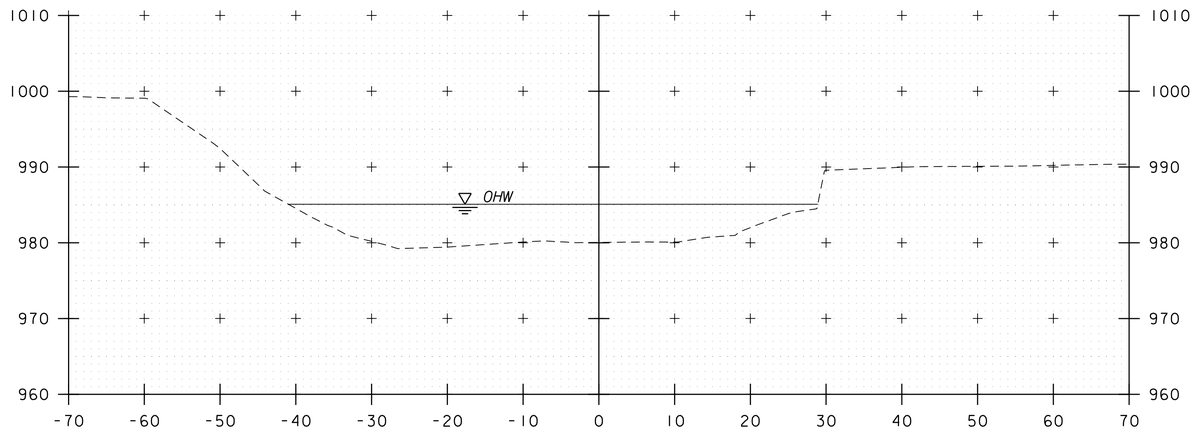
11+75

CHANNEL CROSS SECTIONS

STA. 11+00 TO 12+00

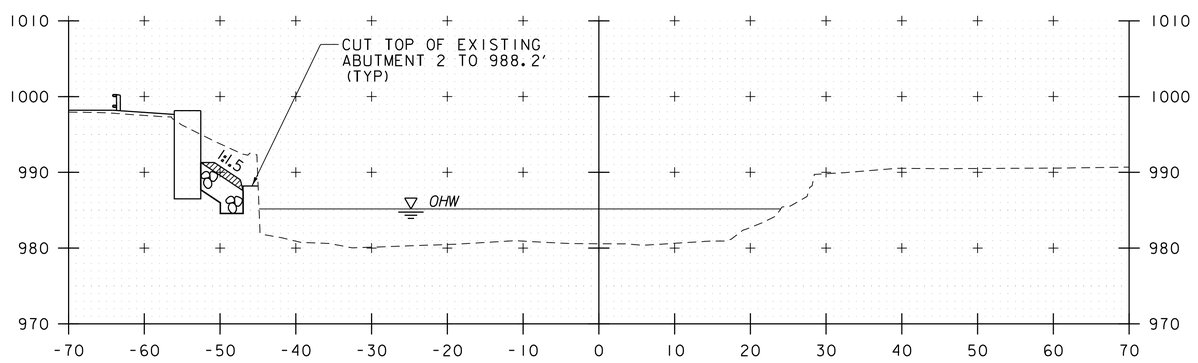
PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068xsl.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
CHANNEL CROSS SECTIONS (2 OF 3)	SHEET 60 OF 73

VHB 57435



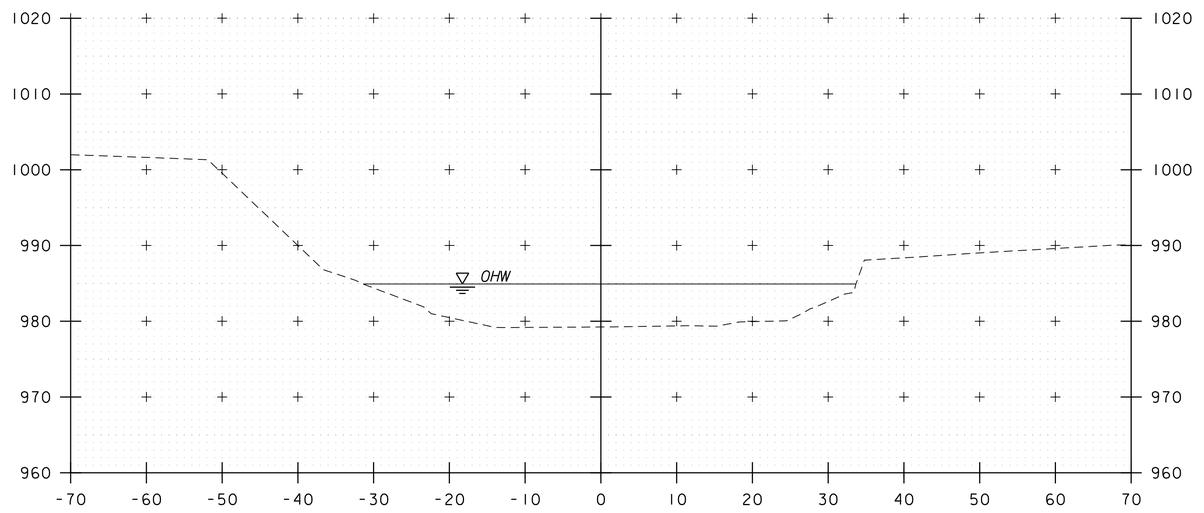
STA. 12+40, LT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

12+50

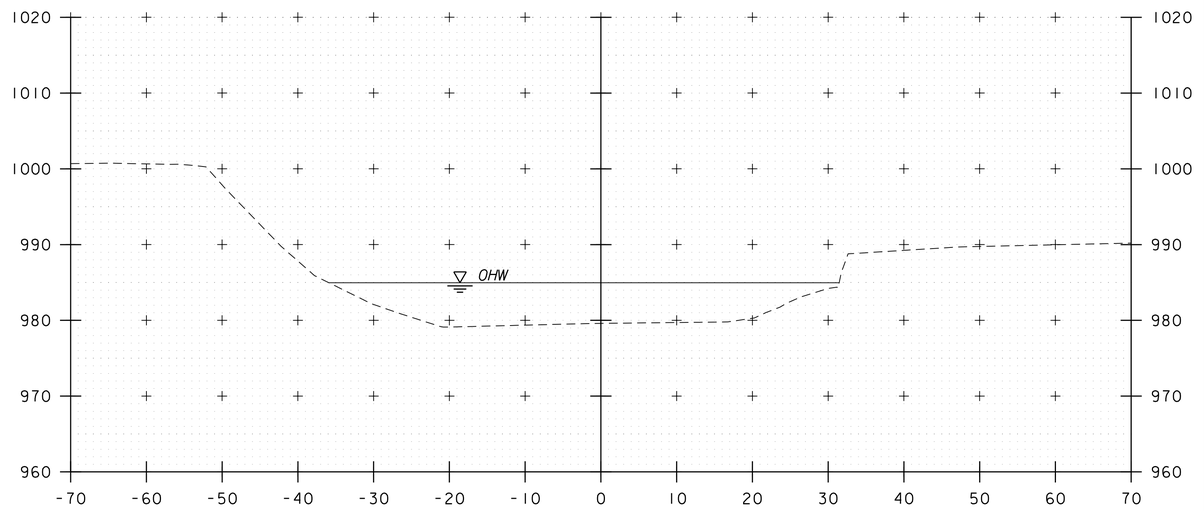


STA. 12+09, LT
BEGIN GRUBBING MATERIAL

12+25



13+00



12+75

CHANNEL CROSS SECTIONS

STA. 12+25 TO 13+00

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068xsl.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
CHANNEL CROSS SECTIONS (3 OF 3)	SHEET 61 OF 73

VHB 57435

EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REMOVAL AND REPLACEMENT OF THE EXISTING TWO-SPAN CONCRETE T-BEAM SUPERSTRUCTURE AND SUBSTRUCTURE OF BRIDGE NO. 25 WITH RELATED APPROACH AND CHANNEL WORK. DURING CONSTRUCTION, TRAFFIC WILL BE DETOURED AROUND A LOCAL OR REGIONAL DETOUR. THIS PROJECT IS LOCATED ON VT 103, A HEAVILY TRAVELED ROAD, LOCATED WHERE MAIN STREET CROSSES THE BLACK RIVER, IN THE TOWN OF LUDLOW, VERMONT. THE EXISTING BRIDGE IS APPROXIMATELY 86 FEET LONG AND HAS A 35'-8" WIDE CONCRETE DECK. THE EXISTING SUBSTRUCTURE CONSISTS OF CONCRETE ABUTMENTS ON TIMBER PILES, WINGWALLS, AND A CONCRETE PIER.

THE BRIDGE REPLACEMENT INCLUDES THE REMOVAL OF THE EXISTING SUPERSTRUCTURE IN ITS ENTIRETY AND THE CONSTRUCTION OF A NEW 105'-6" SINGLE SPAN BRIDGE WITH PRECAST BRIDGE UNITS CONSISTING OF STEEL GIRDERS WITH PRECAST DECK TO CREATE A NEW BRIDGE WIDTH OF 43'-8". NEW INTEGRAL CONCRETE ABUTMENTS AND WINGWALLS WILL BE PRECAST AND SET IN PLACE ON PILES AND LOCATED BEHIND THE EXISTING ABUTMENTS. THE EXISTING ABUTMENTS WILL BE CUT DOWN AND RETAINED TO THE SPECIFIED ELEVATION AND RECEIVE A CONCRETE CLOSURE POUR TO PROTECT THE EXISTING ABUTMENT REINFORCING. ASSOCIATED APPROACH WORK INCLUDES BRIDGE APPROACH SLABS, NEW GUARDRAIL, CURBS, AND SIDEWALKS. ONCE THE BRIDGE IS COMPLETED, THE DETOUR SIGNS WILL BE REMOVED AND RESTORED TO THE PREVIOUS CONDITIONS.

NOTE: AREA OF DISTURBANCE INCLUDES LIMITS OF EARTH DISTURBANCE WITHIN THE PROJECT AREA, AS WELL AS WASTE, BORROW AND STAGING AREAS, AND OTHER EARTH DISTURBING ACTIVITIES WITHIN OR DIRECTLY ADJACENT TO THE PROJECT LIMITS AS SHOWN ON THE ATTACHED EPSC PLAN.

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.50 ACRES.

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY
THE TOPOGRAPHY OF THE AREA IS RELATIVELY FLAT, WITH A STEEP SLOPE DOWN TO THE BLACK RIVER. VT ROUTE 103, ELM STREET (T.H. 328), AND GLEASCOTT (T.H. 314) ARE WITHIN THE PROJECT SITE. THE BRIDGE IS LOCATED IN A HISTORIC DISTRICT WITH HISTORIC BUILDINGS AND A PARKING LOT ADJACENT TO THE SITE.

1.2.2 DRAINAGE, WATERWAYS, BODIES OF WATER, AND PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES
THE BLACK RIVER IS THE ONLY STREAM FEATURE ON THE PROJECT SITE. THE RIVER RUNS WEST TO EAST BENEATH MAIN STREET IN LUDLOW, VERMONT. THE OHW LEVEL IS APPROXIMATELY 50-FEET WIDE WITH AN AVERAGE DEPTH OF TWO FEET. THE AREAS ON EITHER SIDE OF THE RIVER ARE DEVELOPED AND PORTIONS OF THE RIVER BANKS CONSIST OF CONCRETE RETAINING WALLS. THE STREAM SUBSTRATE GENERALLY CONSISTS OF BOULDERS AND COBBLES. THE BLACK RIVER WILL REQUIRE COVERAGE AS A CATEGORY 2 ACTIVITY UNDER THE DEPARTMENT OF THE ARMY VERMONT GENERAL PERMIT.

1.2.3 VEGETATION
THE VEGETATION IN THE PROJECT AREA CONSISTS OF TRIMMED GRASS AND A FEW TREES. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY REPLACEMENT OF THE EXISTING BRIDGE. UPON PROJECT COMPLETION, THE CHANNEL WILL BE ARMORED WITH STONE FILL TYPE III AS SPECIFIED ON THE PLANS. DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

1.2.4 SOILS
ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF WINDSOR, VERMONT. SOILS ON THE PROJECT SITE ARE URBAN LAND-COLTON-CROGHAN COMPLEX, 0% TO 8% SLOPES, "K FACTOR" = 0.43. THE SOIL IS CONSIDERED HIGHLY ERODIBLE.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:
0.0-0.23 = LOW EROSION POTENTIAL
0.24-0.36 = MODERATE EROSION POTENTIAL
0.37 AND HIGHER = HIGH EROSION POTENTIAL

1.2.5 SENSITIVE RESOURCE AREAS
CRITICAL HABITATS: NO
HISTORICAL OR ARCHEOLOGICAL AREAS: YES, STRUCTURES ADJACENT TO THE MAIN STREET BRIDGE ARE IDENTIFIED WITHIN THE LUDLOW VILLAGE HISTORIC DISTRICT
PRIME AGRICULTURAL LAND: NO
THREATENED AND ENDANGERED SPECIES: SUBJECT TO NLEB REVIEW AND DETERMINATION
WATER RESOURCE: BLACK RIVER
WETLANDS: NO

1.3 RISK EVALUATION

THIS PROJECT DOES NOT FALL UNDER THE JURISDICTION OF GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. SHOULD CHANGES PRIOR TO OR DURING CONSTRUCTION RESULT IN ONE OR MORE ACRES OF EARTH DISTURBANCE OR SHOULD THE PROJECT BECOME PART OF A LARGER PLAN OF DEVELOPMENT, THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

ALL MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.

1.4.1 MARK SITE BOUNDARIES
SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

BARRIER FENCE (BF) SHALL BE USED TO PHYSICALLY MARK ARCHAEOLOGICAL AREAS.

1.4.2 LIMIT DISTURBANCE AREA
PREVENTING INITIAL SOIL EROSION BY MINIMIZING THE EXPOSED AREA IS MUCH MORE EFFECTIVE THAN TREATING ERODED SEDIMENT. EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY. THIS CAN LIMIT THE AREA THAT WILL BE DISTURBED AND EXPOSED TO EROSION. EMPLOY TEMPORARY CONSTRUCTION STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE. FOR PROJECTS WHICH FALL UNDER THE CONSTRUCTION GENERAL PERMIT, ONLY THE ACREAGE LISTED ON THE PERMIT AUTHORIZATION MAY BE EXPOSED AT ANY GIVEN TIME.

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE ESTABLISHED WHEREVER POSSIBLE.

1.4.3 SITE ENTRANCE/EXIT STABILIZATION
TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

1.4.4 INSTALL SEDIMENT BARRIERS
SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED PRIOR TO ANY UP SLOPE WORK.

SILT FENCE WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN.

1.4.5 DIVERT UPLAND RUNOFF
DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

THE PROJECT AREA IS RELATIVELY FLAT. THEREFORE IT IS NOT ANTICIPATED THAT DIVERSION MEASURES WILL BE NECESSARY.

1.4.6 SLOW DOWN CHANNELIZED RUNOFF
CHECK STRUCTURES ARE NOT ANTICIPATED FOR THIS PROJECT.

1.4.7 CONSTRUCT PERMANENT CONTROLS
PERMANENT EROSION CONTROL STRUCTURES ARE NOT ANTICIPATED FOR THIS PROJECT.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION
ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE.

SURFACE ROUGHENING OF ALL EXPOSED SLOPES, COMBINED WITH TEMPORARY MULCHING, SHALL BE UTILIZED ON A REGULAR BASIS. BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED TO STABILIZE ALL SLOPES STEEPER THAN 1:3.

THE FORECAST OF RAINFALL EVENTS SHALL TRIGGER IMMEDIATE PROTECTION OF EXPOSED SOILS.

1.4.9 WINTER STABILIZATION
VARIOUS MEASURES SPECIFIC TO WINTER MAY BE NECESSARY SHOULD THE PROJECT EXTEND INTO WINTER (OCTOBER 15 THROUGH APRIL 15). REFER TO THE LOW RISK SITE HANDBOOK FOR GUIDANCE.

1.4.10 STABILIZE SOIL AT FINAL GRADE
EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH.

1.4.11 DE-WATERING ACTIVITIES
DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS.

TREATMENT OF DEWATERING COFFERDAM IS ANTICIPATED. A LOCATION FOR THE TREATMENT HAS BEEN PROPOSED AND IS SHOWN ON THE PLANS. HOWEVER, THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR.

1.4.12 INSPECT YOUR SITE
INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS OR CONSTRUCTION GENERAL PERMIT AUTHORIZATION STIPULATIONS.

1.5 SEQUENCE AND STAGING

THIS SECTION WILL BE DEVELOPED BY THE CONTRACTOR USING THE GUIDANCE OUTLINED IN THE VTRANS EPSC PLAN CONTRACTOR CHECKLIST.

1.5.1 CONSTRUCTION SEQUENCE

1.5.2 OFF-SITE ACTIVITIES
IN ADDITION TO THE CONTRACTOR CHECKLIST ANY ACTIVITIES OUTSIDE THE CONSTRUCTION LIMITS SHALL FOLLOW SUBSECTIONS 105.25- 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

1.5.3 UPDATES

N

VT STATE PLANE GRID

SOIL CLASSIFICATION

URBAN LAND-COLTON-CROGHAN COMPLEX (75B)
0% TO 8% SLOPES
"K FACTOR" = 0.48
CLASSIFIED HIGH EROSION POTENTIAL

RIPARIAN BUFFER

50'-0" (TYP)

CONCRETE CRIB RETAINING WALL

BLACK RIVER

RIGHT-OF-WAY

P.L.

TO MOUNT HOLLY

BEGIN PROJECT
STA. 101+52.50

BLACK RIVER GOOD NEIGHBOR SERVICES, INC.

BLACK RIVER ASSOCIATES, INC.

ROADWAY POT STA. 102+94.95 =
CHANNEL POT STA. 11+50.00

END APPROACH
STA. 5+50.00

END PROJECT
STA. 104+37.50

END BRIDGE
STA. 103+63.67
F.G. 997.76

GLEASCOTT AVE (T.H. 314)

BEGIN APPROACH
STA. 100+75.00

VT ROUTE 103 (T.H. 1)

BEGIN BRIDGE
STA. 102+54.99
F.G. 995.21

FINK, MELVIN

ELM ST. 1+00 (T.H. 328)

BEGIN APPROACH
STA. 1+50.00

ARCHAEOLOGICALLY SENSITIVE AREA (A)

ARCHAEOLOGICALLY SENSITIVE AREA (B)

SPRINGFIELD MEDICAL CARE SYSTEMS, INC.

AMATO, JOSEPH

TO CAVENDISH

END APPROACH
STA. 105+75.00

SCALE 1" = 20'-0"
20 0 20

NOTE:
THIS MAPPING DEPICTS POTENTIALLY SENSITIVE AREAS TO BE AVOIDED DURING CONSTRUCTION AND AS WORK AREAS. IF THESE AREAS CANNOT BE AVOIDED, THEN THE BOUNDARIES OF THE ARCHAEOLOGICALLY SENSITIVE AREAS SHOULD BE DETERMINED THROUGH SYSTEMATIC SUBSURFACE TESTING.

SOIL CLASSIFICATION

URBAN LAND-COLTON-CROGHAN COMPLEX (75B)
0% TO 8% SLOPES
"K FACTOR" = 0.48
CLASSIFIED HIGH EROSION POTENTIAL

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068bdr_ero.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.A. FIALA
EPSC EXISTING CONDITIONS SHEET

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 63 OF 73

VHB 57435

NOTE: SEE EROSION CONTROL DETAILS FOR SYMBOLOGY.

N

VT STATE PLANE GRID

SANDBAG COFFERDAM FOR REMOVAL OF PIER

ROADWAY POT STA. 102+94.95 =
CHANNEL POT STA. 11+50.00

END PROJECT
STA. 104+37.50

END BRIDGE
STA. 103+63.67
F.G. 997.76

END APPROACH
STA. 5+50.00

BEGIN PROJECT
STA. 101+52.50

BEGIN APPROACH
STA. 100+75.00

BEGIN BRIDGE
STA. 102+54.99
F.G. 995.21

BEGIN APPROACH
STA. 1+50.00

END APPROACH
STA. 105+75.00

ARCHAEOLOGICALLY SENSITIVE AREA (A)

ARCHAEOLOGICALLY SENSITIVE AREA (B)

STONE FILL FOR REMOVAL OF PIER

STONE FILL, TYPE III (TYP)

ONCE PIER IS REMOVED, FILL VOID WITH SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL) (TYPE III)

VT ROUTE 103 (T.H. 1)

ELM ST. (T.H. 328)

GLEASCOTT AVE (T.H. 314)

TO MOUNT HOLLY

TO CAVENDISH

RIGHT-OF-WAY

BLACK RIVER

SCALE 1" = 20'-0"
20 0 20

NOTE:
THIS MAPPING DEPICTS POTENTIALLY SENSITIVE AREAS TO BE AVOIDED DURING CONSTRUCTION AND AS WORK AREAS. IF THESE AREAS CANNOT BE AVOIDED, THEN THE BOUNDARIES OF THE ARCHAEOLOGICALLY SENSITIVE AREAS SHOULD BE DETERMINED THROUGH SYSTEMATIC SUBSURFACE TESTING.

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)
FILE NAME: z10j068bdr_ero.dgn	PLOT DATE: 8/23/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: A.P. GUYETTE
EPSC CONSTRUCTION CONDITIONS SHEET	SHEET 64 OF 73

VHB 57435

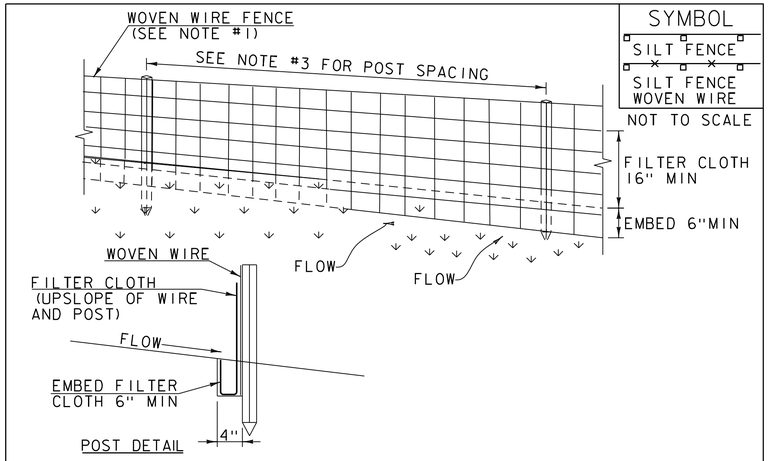
NOTE: SEE EROSION CONTROL DETAILS FOR SYMBOLOGY.

PROJECT NAME:	LUDLOW
PROJECT NUMBER:	BRF 025-1(42)

FILE NAME: z10j068bdr_ero.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.A. FIALA
EPSC FINAL CONDITIONS SHEET

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 65 OF 73

VHB 57435



SYMBOL

SILT FENCE

SILT FENCE WOVEN WIRE

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE REINFORCED FENCE IS REQUIRED WITHIN 100' UPSLOPE OF RECEIVING WATERS WHEN THE PROJECT FALLS UNDER A CONSTRUCTION STORMWATER PERMIT. WOVEN WIRE SHALL BE A MIN. 14 GAUGE WITH A 6" MAX. MESH OPENING.
2. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI100X, STABILINKA T140N OR APPROVED EQUIVALENT.
3. POST SPACING FOR WIRE-BACKED FENCE SHALL BE 10' MAXIMUM. FOR FILTER-CLOTH FENCE, WHEN ELONGATION IS >50%, POST SPACING SHALL NOT EXCEED 4' AND WHEN ELONGATION IS <50%, POST SPACING SHALL NOT EXCEED 6'.
4. WOVEN WIRE FENCE IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY 6" AND FOLDED.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SILT FENCE

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE FOR SILT FENCE (PAY ITEM 649.51) OR GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED (PAY ITEM 649.515).

REVISIONS	
MARCH 21, 2008	WHF
DECEMBER 11, 2008	WHF
JANUARY 13, 2009	WHF

VAOT RURAL AREA MIX

LBS/AC					
% WEIGHT	BROADCAST	HYDROSEED	NAME	GERM %	PURITY %
37.5%	22.5	45	CREEPING RED FESCUE	85%	98%
37.5%	22.5	45	TALL FESCUE	90%	95%
5.0%	3	6	RED TOP	90%	95%
15.0%	9	18	BIRDSFOOT TREFOIL	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	85%	95%
100%	60	120			

VAOT URBAN AREA MIX

LBS/AC					
% WEIGHT	BROADCAST	HYDROSEED	NAME	GERM %	PURITY %
42.5%	34	68	CREEPING RED FESCUE	85%	98%
10.0%	8	16	PERENNIAL RYE GRASS	90%	95%
42.5%	34	68	KENTUCKY BLUE GRASS	85%	85%
5.0%	4	8	ANNUAL RYE GRASS	85%	95%
100%	80	160			

SOIL AMENDMENT GUIDANCE

FERTILIZER		LIME	
BROADCAST	HYDROSEED	BROADCAST	HYDROSEED
10-20-10	*FOLLOW*	PELLETIZED	*FOLLOW*
500 LBS/AC	*MANUFACTURER*	2 TONS/AC	*MANUFACTURER*

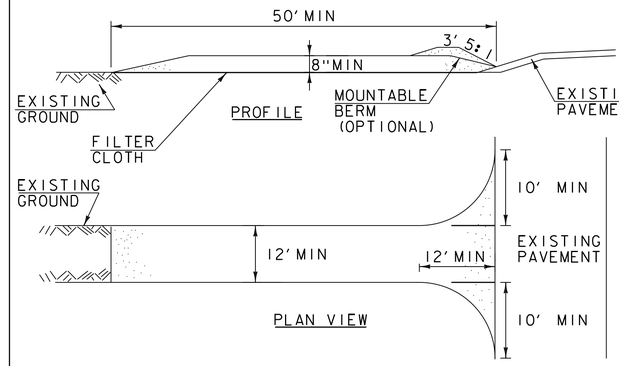
CONSTRUCTION GUIDANCE

1. RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
2. URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

TURF ESTABLISHMENT

REVISIONS	
JUNE 23, 2009	WHF
JANUARY 15, 2010	WHF
FEBRUARY 16, 2011	WHF



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE- USE 1-4" STONE, RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH- NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH APPLIES).
3. THICKNESS- NOT LESS THAN 8".
4. WIDTH- 12' MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24' IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE MUST BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED ACCORDING TO PERMIT REQUIREMENTS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STABILIZED CONSTRUCTION ENTRANCE

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

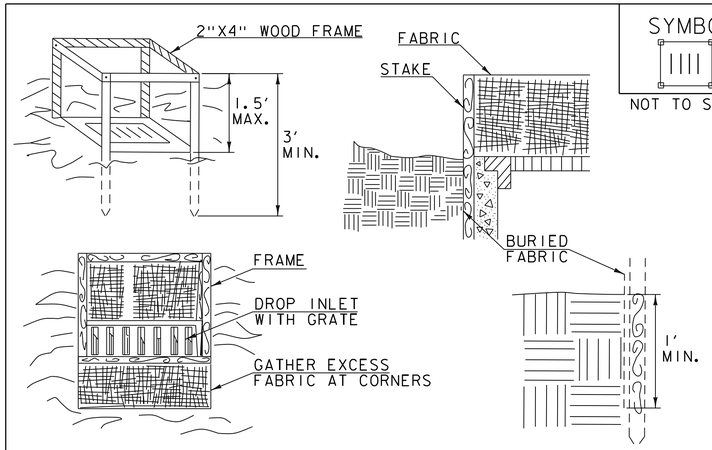
REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068details ero.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: VTRANS
EROSION CONTROL DETAILS (1 OF 2)

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 66 OF 73

VHB 57435



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. FILTER FABRIC SHALL HAVE AN APPARENT OPENING SIZE OF 40-85. BURLAP MAY BE USED FOR SHORT TERM APPLICATIONS.
2. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS. IF JOINTS ARE NEEDED THEY WILL BE OVERLAPPED TO THE NEXT STAKE.
3. STAKE MATERIALS WILL BE STANDARD 2"x 4" WOOD OR EQUIVALENT METAL WITH A MINIMUM LENGTH OF 3'.
4. SPACE STAKES EVENLY AROUND INLET 3' APART AND DRIVE A MINIMUM 18" DEEP. SPANS GREATER THAN 3' MAY BE BRIDGED WITH THE USE OF WIRE MESH BEHIND THE FILTER FABRIC FOR SUPPORT.
5. FABRIC SHALL BE EMBEDDED 1' MINIMUM BELOW GROUND AND BACKFILLED. IT SHALL BE SECURELY FASTENED TO THE STAKES AND FRAME.
6. A 2" x 4" WOOD FRAME SHALL BE COMPLETED AROUND THE CREST OF THE FABRIC FOR OVER FLOW STABILITY.
7. MAXIMUM DRAINAGE AREA 1 ACRE

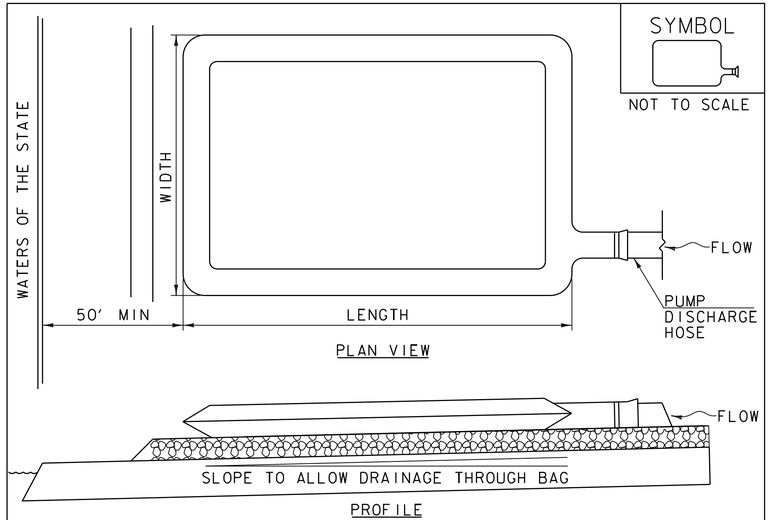
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FILTER FABRIC DROP INLET PROTECTION

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR INLET PROTECTION DEVICE, TYPE I (PAY ITEM 653.40).

REVISIONS	
MARCH 7, 2008	WHF
JANUARY 13, 2009	WHF



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

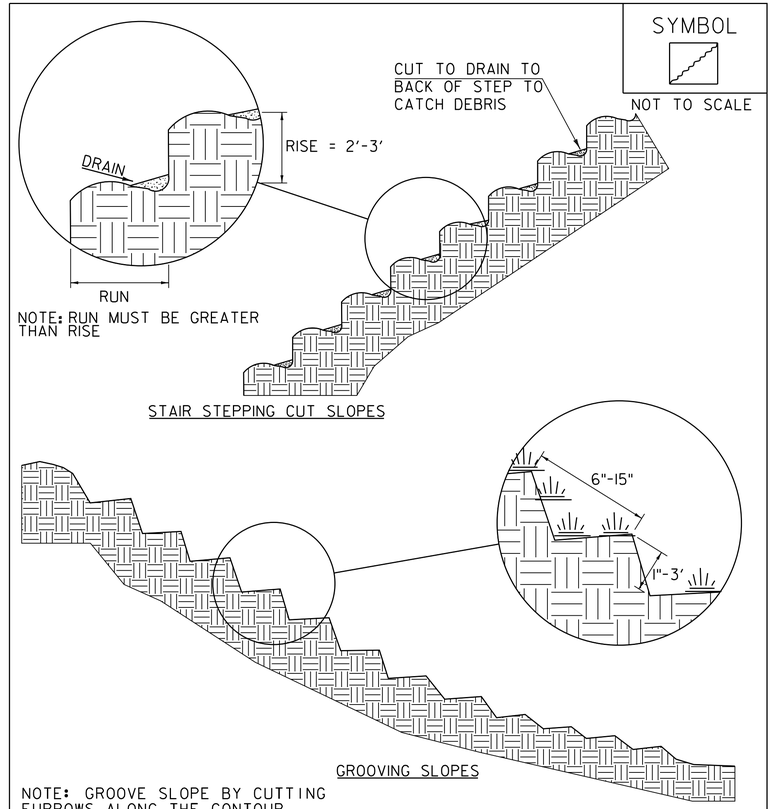
1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION EFFICIENCY.
4. FILTER BAGS SHALL BE LOCATED A MINIMUM OF 50' FROM WATERS OF THE STATE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. THE NECK OF THE FILTER BAG SHALL BE STRAPPED TIGHTLY TO THE DISCHARGE HOSE.
6. A FILTER BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE.
7. FILTER BAG SHALL BE DISPOSED OF AS APPROVED IN THE EPSC PLAN OR AS DIRECTED BY THE ENGINEER.

FILTER BAG

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR FILTER BAG (PAY ITEM 653.45) AND AS SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



SYMBOL

NOT TO SCALE

STAIR STEPPING CUT SLOPES

GROOVING SLOPES

NOTE: GROOVE SLOPE BY CUTTING FURROWS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND RETAIN LIME, FERTILIZER AND SEED.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

REVISIONS	
APRIL 1, 2008	WHF
JANUARY 13, 2009	WHF

vhb

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: z10j068details ero.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: VTRANS
EROSION CONTROL DETAILS (2 OF 2)

PLOT DATE: 8/23/2016
DRAWN BY: E.A. FIALA
CHECKED BY: A.P. GUYETTE
SHEET 67 OF 73

VHB 57435

STATE OF VERMONT
AGENCY OF TRANSPORTATION

RIGHT - OF - WAY DETAIL SHEET

TABLE OF PROPERTY ACQUISITION

PARCEL NO.	PROPERTY OWNER	SHEET NO.	BEGINNING STATION	ENDING STATION	TAKE	REMAINDER	RIGHT			RECORDING DATA					REMARKS
					AREA±	AREA±	TYPE	(T)/(P)	AREA ±	TITLE	DATE	TOWN / CITY	BOOK	PAGE	
1	BLACK RIVER GOOD NEIGHBOR	1	101+37.58 LT	102+51.36 LT			HIGHWAY	P	576 SF						
	SERVICES, INC.		102+02 LT	102+29.66 LT			SLOPE	T	292 SF						
2	SPRINGFIELD MEDICAL CARE	1	102+66.70 RT	102+92.59± RT			HIGHWAY	P	228± SF						
	SYSTEMS, INC.	1	102+36 RT	103+03.77± RT			CONSTRUCTION	T	283± SF						INCLUDES BF & EC
			102+50.38 RT	102+95.75 RT			ACCESS	P	699 SF						
			102+84.50 RT	103+03.77± RT			CHANNEL	P	181± SF						INCLUDES STONE FILL
3	BLACK RIVER ASSOCIATES, INC.	1	103+03.87± LT	104+49.67 LT			HIGHWAY	P	926± SF						
			103+06 LT	104+10 LT			CONSTRUCTION	T	3,860 SF						INCLUDES TRAFFIC CONTROL BARRIER
			104+37 LT	104+65 LT			CONSTRUCTION	T	56 SF						INCLUDES BF & EC
4	BLACK RIVER AMATO, L.P.	1	103+67.16± RT	104+36.92 RT			HIGHWAY	P	508± SF						
			103+75.35 ± RT	104+08.71 RT			CHANNEL	P	739± SF						INCLUDES STONE FILL
			103+95.44 ± RT	104+22 RT			CONSTRUCTION	T	294 SF						INCLUDES BF & EC
			104+36.92 RT	104+81 RT			CONSTRUCTION	T	86 SF						INCLUDES BF & EC
5	TDS TELECOM		101+37.58 LT	105+12 RT 104+81 RT											UTILITY
6	COMCAST OF CONNECTICUT/GEORGIA/		101+37.58 LT	105+12 RT 104+81 RT											UTILITY
	MASSACHUSETTS/ NEW HAMPSHIRE/														
	NEW YORK/ NORTH CAROLINA/														
	VERMONT, LLC														
7	TOWN OF LUDLOW		101+37.58 LT	105+12 RT 104+81 RT											UTILITY
8	LUDLOW ELECTRIC LIGHT DEPARTMENT		101+37.58 LT	105+12 RT 104+81 RT											UTILITY
9	TELEPHONE OPERATING COMPANY		101+37.58 LT	105+12 RT 104+81 RT											UTILITY
	OF VERMONT, LLC														

TABLE OF REVISIONS

REVISION NO.	SHEET NO.	DESCRIPTION	DATE

PLAN LEGEND

- EXISTING RIGHT-OF-WAY
- TAKING WITH ACCESS
- TAKING WITHOUT ACCESS
- CLEAR ZONE (CZ)
- PROPERTY LINE (P / L)
- TOE OF SLOPE
- TOP OF CUT
- SLOPE RIGHT (SR (P))
- CONSTRUCTION RIGHT (CONST.(T))
- PROJECT DEMARCATION FENCE (PDF)

EC	-EROSION CONTROL
(P)	-PERMANENT
(T)	-TEMPORARY
DR.	-DRAINAGE RIGHT
DIT.	-DITCHING RIGHT
CH.	-CHANNEL RIGHT
DRIVE	-DRIVE RIGHT
CUL.	-CULVERT RIGHT
C&T	-CLEARING & TRIMMING RIGHT
SR	-SLOPE RIGHT
UE	-UTILITY EASEMENT

APPROVED: RYAN CLOUTIER DATE: 12-9-14
CHIEF, PLANS & TITLES

PROJECT NAME: **LUDLOW**
PROJECT NUMBER: **BRF 025-1(42)**

FILE NAME: **r10j068detail.xls**
PROJECT LEADER: **A. GUYETTE**
DESIGNED BY: **E. FIALA**
R.O.W. DETAIL SHEET

PLOT DATE: 14-JAN-2015
DRAWN BY: **MR**
CHECKED BY: **JB**
SHEET 68 OF 73

N

VT STATE PLANE GRID

SOLID ROCK EXCAVATION

STA. 101+35 - 102+14, RT
STA. 102+10 - 102+57, LT
STA. 102+32 - 102+75, RT
STA. 103+43 - 104+68, LT
STA. 103+60 - 105+03, RT

REMOVAL OF EXISTING CURB

STA. 101+35 - 102+17, RT
STA. 102+10 - 102+57, LT
STA. 102+32 - 102+75, RT
STA. 103+43 - 104+68, LT
STA. 103+60 - 105+24, RT

VERTICAL GRANITE CURB

STA. 101+35 - 102+17, RT
STA. 102+10 - 102+51, LT
STA. 102+32 - 102+71, RT
STA. 103+49 - 104+71, LT
STA. 103+69 - 105+25, RT

PORTLAND CEMENT CONCRETE SIDEWALK, 8 INCH

STA. 103+88 - 104+28, LT

PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH

STA. 101+35 - 102+14, RT
STA. 102+10 - 102+50, LT
STA. 102+32 - 102+74, RT
STA. 103+46 - 103+88, LT
STA. 103+70 - 104+75, RT
STA. 104+27 - 104+71, LT

BOX BEAM GUARDRAIL

STA. 102+22 - 102+24, LT
STA. 102+50 - 102+51, RT
STA. 103+36 - 103+40, LT
STA. 104+00 - 104+03, RT

GUARDRAIL APPROACH SECTION, 3 RAIL BOX BEAM

STA. 102+22 - 102+47, LT
STA. 102+51 - 102+74, RT
STA. 103+46 - 103+52, LT
STA. 103+73 - 104+03, RT

BRIDGE RAILING, GALVANIZED STEEL TUBING/CONCRETE COMBINATION

STA. 102+47 - 103+46, LT
STA. 102+74 - 103+73, RT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA. 102+40 - 102+56, LT
STA. 102+66 - 102+77, RT
STA. 103+40 - 103+52, LT
STA. 103+63 - 104+79, RT

COLD PLANING, BITUMINOUS PAVEMENT

STA. 100+80 - 101+00, LT & RT
STA. 1+50 - 2+00, LT & RT (ELM ST.)
STA. 5+00 - 5+50, LT & RT (GLEASCOTT AVE)
STA. 104+75 - 105+75, LT & RT

CONSTRUCT 5' PAVED APRON

STA. 103+57 - 104+39, RT

CONSTRUCT 6' PAVED APRON

STA. 101+19 - 101+31, RT
STA. 105+25 - 105+43, RT

CONSTRUCT 22' PAVED APRON

STA. 101+00 - 102+32, LT

1
BLACK RIVER GOOD NEIGHBOR SERVICES, INC.

3
BLACK RIVER ASSOCIATES, INC.

N/F BAPTIST CHURCH

TOWN OF LUDLOW GLEASCOTT AVE.

N/F FINK, MELVIN D.

TOWN OF LUDLOW ELM ST.

2
SPRINGFIELD MEDICAL CARE SYSTEMS, INC.

4
BLACK RIVER AMATO, L.P.

BEGIN R.O.W. PROJECT
BRF 025-1(42)
STA. 101+37.58, 24.75' LT

END R.O.W. PROJECT
BRF 025-1(42)
STA. 104+81, 30' RT

BEGIN APPROACH STA. 100+80.00
BEGIN PROJECT STA. 101+37.50
BEGIN BRIDGE STA. 102+61.22
BEGIN APPROACH STA. 1+50.00
END APPROACH STA. 5+50.00
END BRIDGE STA. 103+80.62
END APPROACH STA. 105+75.00

EXISTING BRIDGE DATA

TWO SPAN CONCRETE T-BEAM BUILT IN 1928
SPAN LENGTH = 42'-0"
STRUCTURE LENGTH = 86'-0"
DECK WIDTH OUT TO OUT = 35'-8"
BRIDGE WIDTH CURB TO CURB = 23'-2"

A	10.71	N61°10'16"E	
B	14.34	N1°58'53"E	
C	25.90	S61°10'16"W	
D	14.63±	ALONG OHW	
E	69.76	N61°10'16"E	
F	13.52±	ALONG OHW	
G	4.77	N61°10'16"E	
H	29.31	S73°54'32"W	
I	13.06	S70°39'18"E	
J	43.51	N61°10'16"E	
K	2.25	N28°49'44"W	
AA	8.02±	N61°10'16"E	
BB	18.05	S52°44'10"E	
CC	7.19	N66°22'34"W	
DD	8.05	N56°30'8"E	
EE	29.31	S73°54'32"W	
FF	8.27	S27°54'48"E	
GG	28.75	S6°54'34"E	
HH	3.56	S13°44'30"W	

0 20 40
SCALE IN FEET

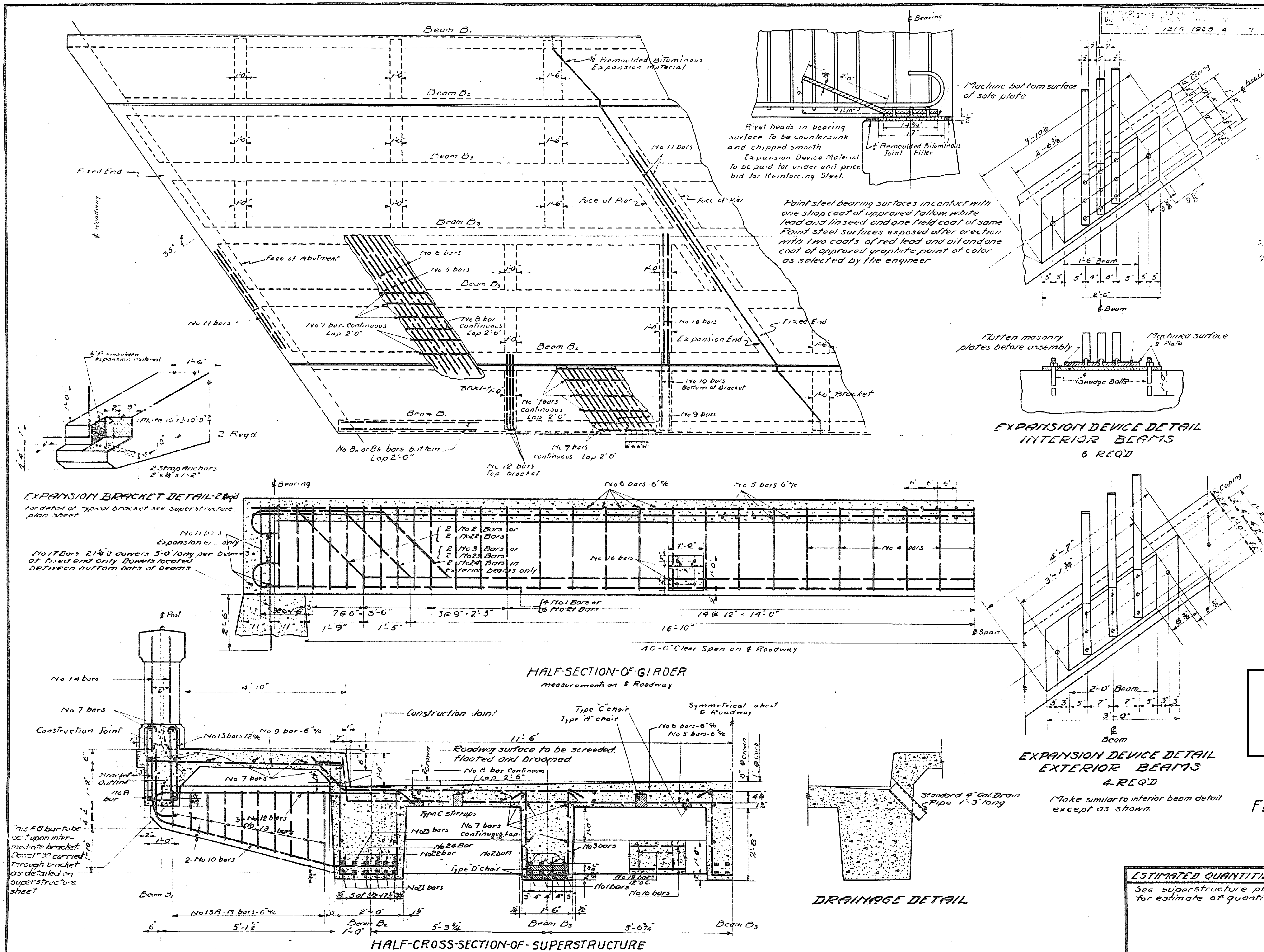
LINES SHOWN ON THIS PLAN AS EXISTING PROPERTY LINES P/L ARE BELIEVED TO BE ACCURATE BUT SHOULD NOT BE RELIED UPON FOR PURPOSES UNRELATED TO THE STATE OF VERMONT'S ACQUISITION OF LAND AND RIGHTS FOR THIS PROJECT.

FOR R.O.W. USE ONLY

PROJECT NAME: LUDLOW
PROJECT NUMBER: BRF 025-1(42)

FILE NAME: r10j068layl.dgn
PROJECT LEADER: T. SUMNER
DESIGNED BY: VHB
ROW LAYOUT SHEET 1OF 1

PLOT DATE: 14-JAN-2015
DRAWN BY: A. EGIZI
CHECKED BY: R. CLOUTIER
SHEET 69 OF 73



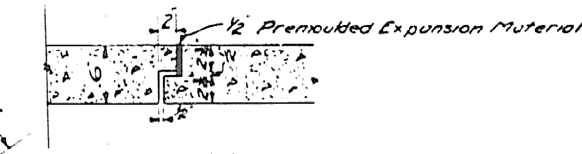
REINFORCING STEEL SCHEDULE

Bar	Size	Total lgth.	Dimensions
No 1 bar	1 1/8" sq	43'-6"	5" R; 5"; 42'-0"
No 21 bar	1 1/4" ø		
No 2 bar	1 1/8" sq	48'-6"	5" R; 3'-6"; 2'-6"; 5"; 1'-0", 2'-6", 35'-0", 2'-6", 1'-0"; 42'-0"
No 22 bar	1 1/4" sq		
No 23 bar	1 1/4" sq		42'-0"
No 3 bar	1 1/8" sq	48'-6"	2'-6", 2'-6", 32'-0", 2'-6", 2'-6"
No 24 bar	1 1/4" sq	48'-6"	4'-6", 2'-6", 28'-0", 2'-6", 4'-6"
No 12 bar	1" Rd	10'-9"	5" R; 5"; 9'-6"
No 5 bar	5/8" Rd	25'-0"	23'-2"; 1", 23'-0", 1"; c = 1'-0", d = 11"
No 6 bar	5/8" Rd	26'-0"	23'-2"; 1'-0", 23'-2", 1'-0"; c = 1'-6", d = 11"

STIRRUPS	Size	Type	a	Total Length
No 4 bar	1/2" Rd	A		8'-0"
No 13 bar	3/8" Rd	B	2'-4"	7'-0"
No 18 bar	1/2" Rd	C		9'-0"
No 19 bar	3/8" Rd	D		3'-3"
No 13a-m bar	3/8" Rd	B	Varies	Varies

Type A: 6"; 1'-2"; 2'-11"
Type B: 2" R; 4"; a; 6"
Type C: 1'-1"; 3'-1"; 2'-11"; 6"; 1'-7"
Type D: 3"; 9"; 7"

No 7 bar	1" Rd	22'-6"
No 8a bar	3/4" Rd	30'-0"
No 9 bar	5/8" Rd	5'-9"
No 10 bar	5/8" Rd	9'-3"
No 11 bar	5/8" Rd	23'-0"
No 14 bar	1" sq	4'-9"
No 15 bar	5/8" Rd	3'-3"
No 16 bar	3/4" Rd	12'-0"
No 8b bar	3/4" Rd	16'-6" - one 3" R hook
No 30 bar	3/4" Rd	6'-0"



SIDEWALK EXPANSION JOINT

All concrete in this superstructure to be Class A concrete (1:2:4 mix)

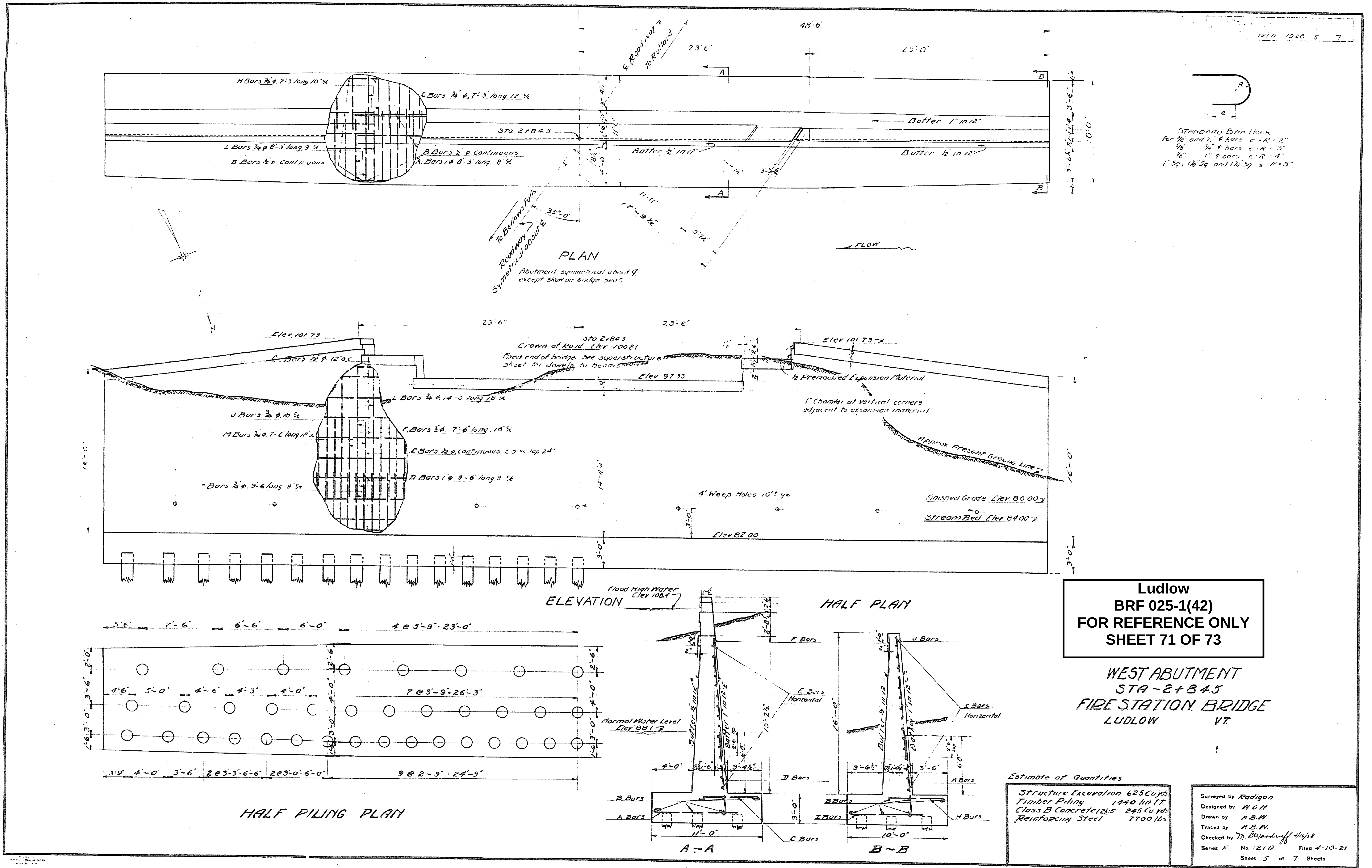
Ludlow
BRF 025-1(42)
FOR REFERENCE ONLY
SHEET 70 OF 73

SUPER STRUCTURE
FIRE STATION BRIDGE
LUDLOW-VT.

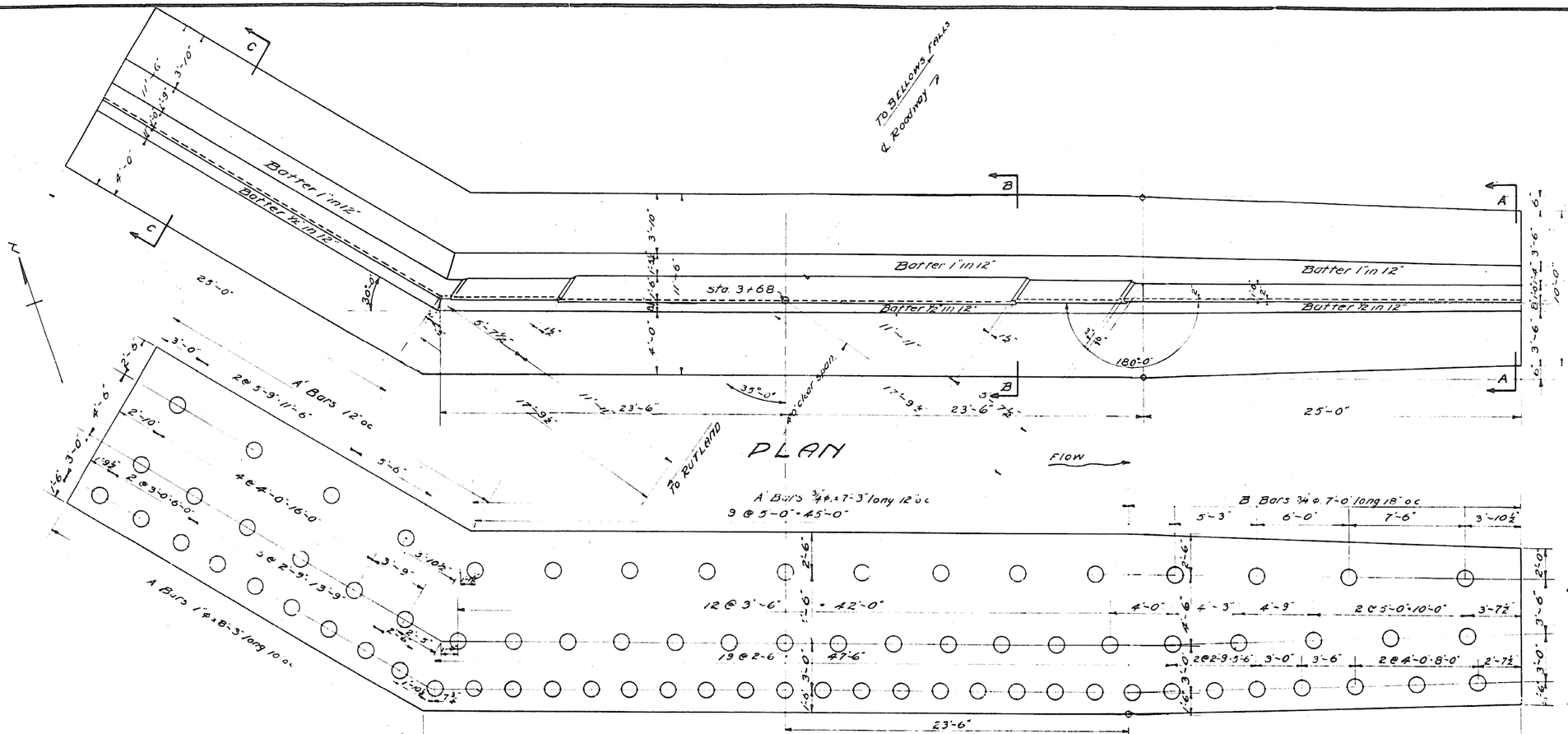
ESTIMATED QUANTITIES

See superstructure plan sheet for estimate of quantities.

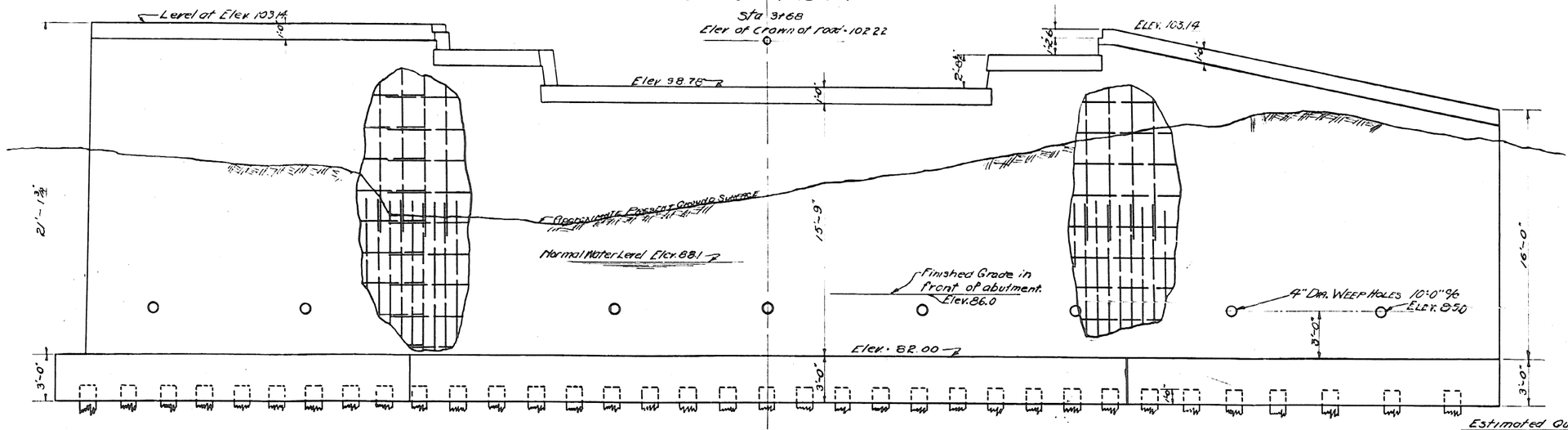
Surveyed by
Designed by
Drawn by A.R.P. 3/10/38
Traced by A.R.P. 3/10/38
Checked by M. L. Woodruff 4-7-38
Series F No. 121 A Filed 4-18-21
Sheet 4 of 7 Sheets



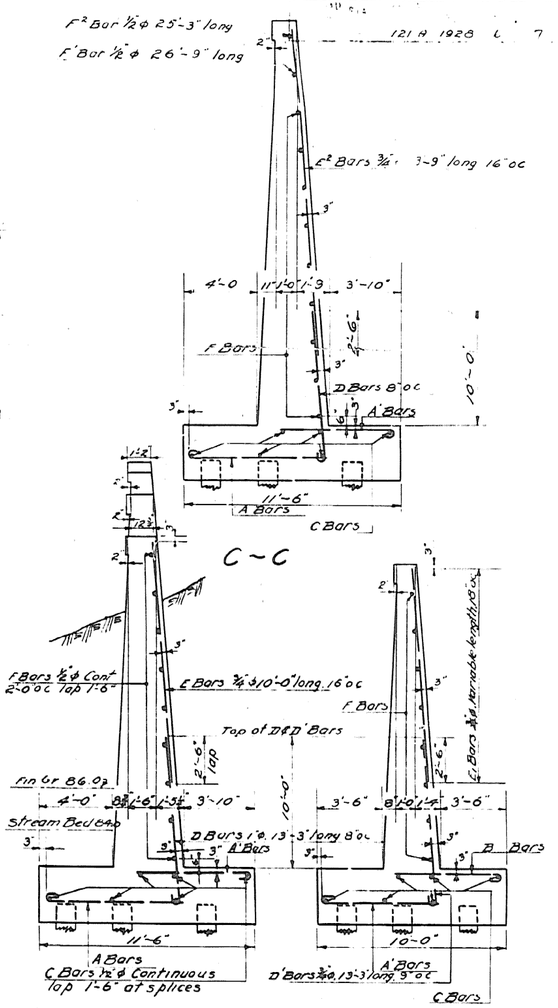
Ludlow
BRF 025-1(42)
FOR REFERENCE ONLY
SHEET 71 OF 73



PILING PLAN



ELEVATION



See Pier sheet for general notes, score marks and construction joint detail See West Abutment sheet for standard bar hook

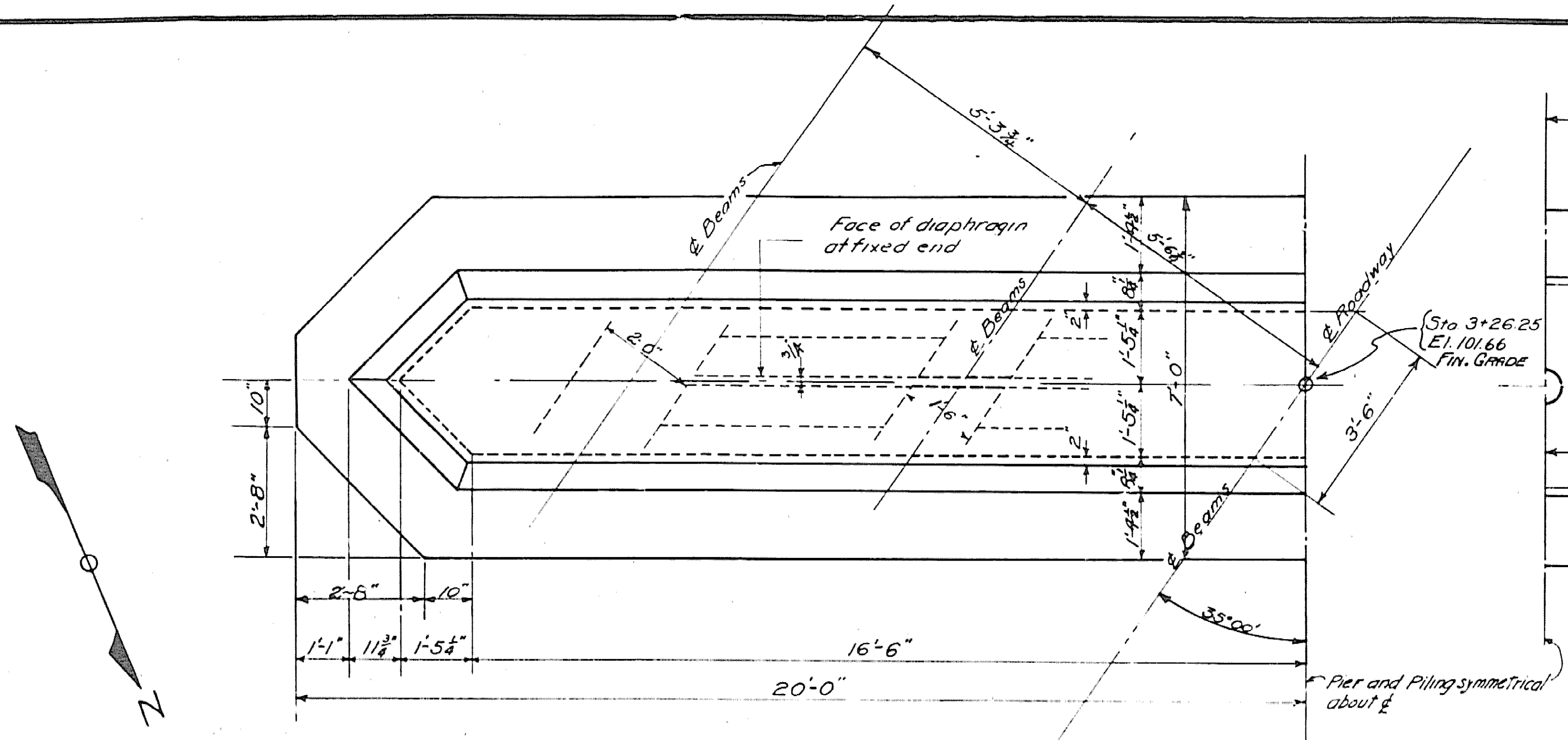
EAST ABUTMENT
STA. 3+68
FIRE STATION BRIDGE
LUDLOW VT.

Ludlow
BRF 025-1(42)
FOR REFERENCE ONLY
SHEET 72 OF 73

Estimated Quantities

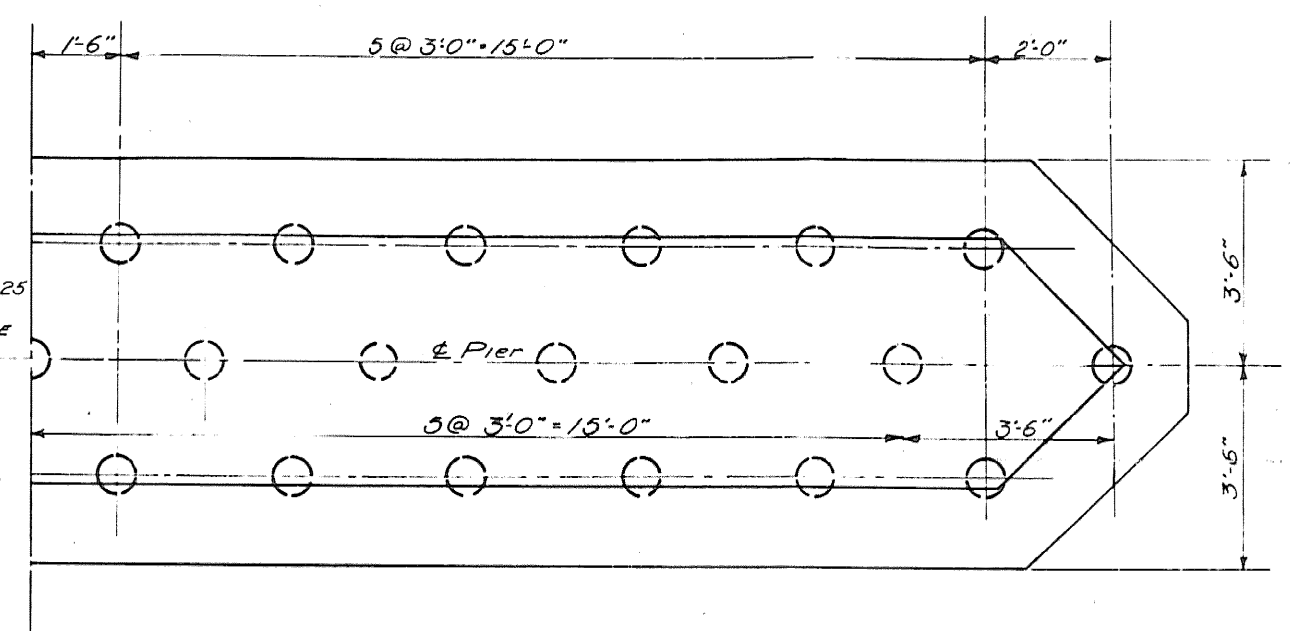
Structure Excavation	855 Cu yds.
Timber Piling	1320 Lin. ft
Class B Concrete 1:2½:5	282 cu. yds
Reinforcing Steel	10,000 Lbs

Surveyed by Radigan
Designed by W.G.H
Drawn by H.B.W
Traced by H.B.W
Checked by M.R. Woodruff 4/16/21
Series F No. 121A Filed 4-18-21
Sheet 6 of 7 Sheets



HALF PLAN

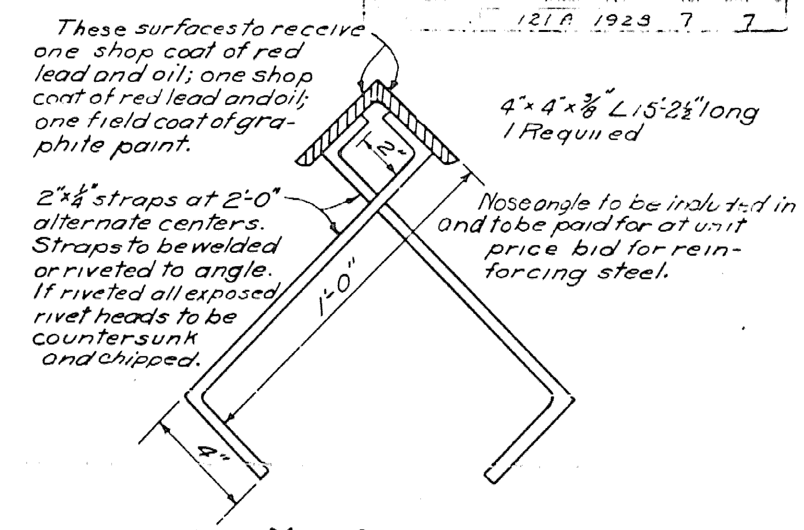
Scale: ½" = 1'-0"



HALF PILING PLAN

Scale: ½" = 1'-0"

These surfaces to receive one shop coat of red lead and oil; one shop coat of red lead and oil; one field coat of graphite paint.



NOSE ANGLE — ONE REQUIRED

Nose angle to extend from footing to coping on upstream end of pier adjacent.

GENERAL NOTES:

All work and materials shall conform to the Standard Road and Bridge Specifications of the Vermont Department of Highway, 1926.

Any suitable structure excavation used by the Contractor for any purpose other than for backfill or approach fill shall be replaced by the Contractor at his own expense unless same is ordered wasted by the Engineer.

All concrete in pier and abutments to be Class B (1-2½-5) mix.

All steel to be deformed bars. Reinforcing steel shall conform to the Standard Specifications for Billet Steel Concrete Reinforcement bars, Intermediate or Structural Grade, of the American Society for Testing Materials, Serial Designation A 15-14.

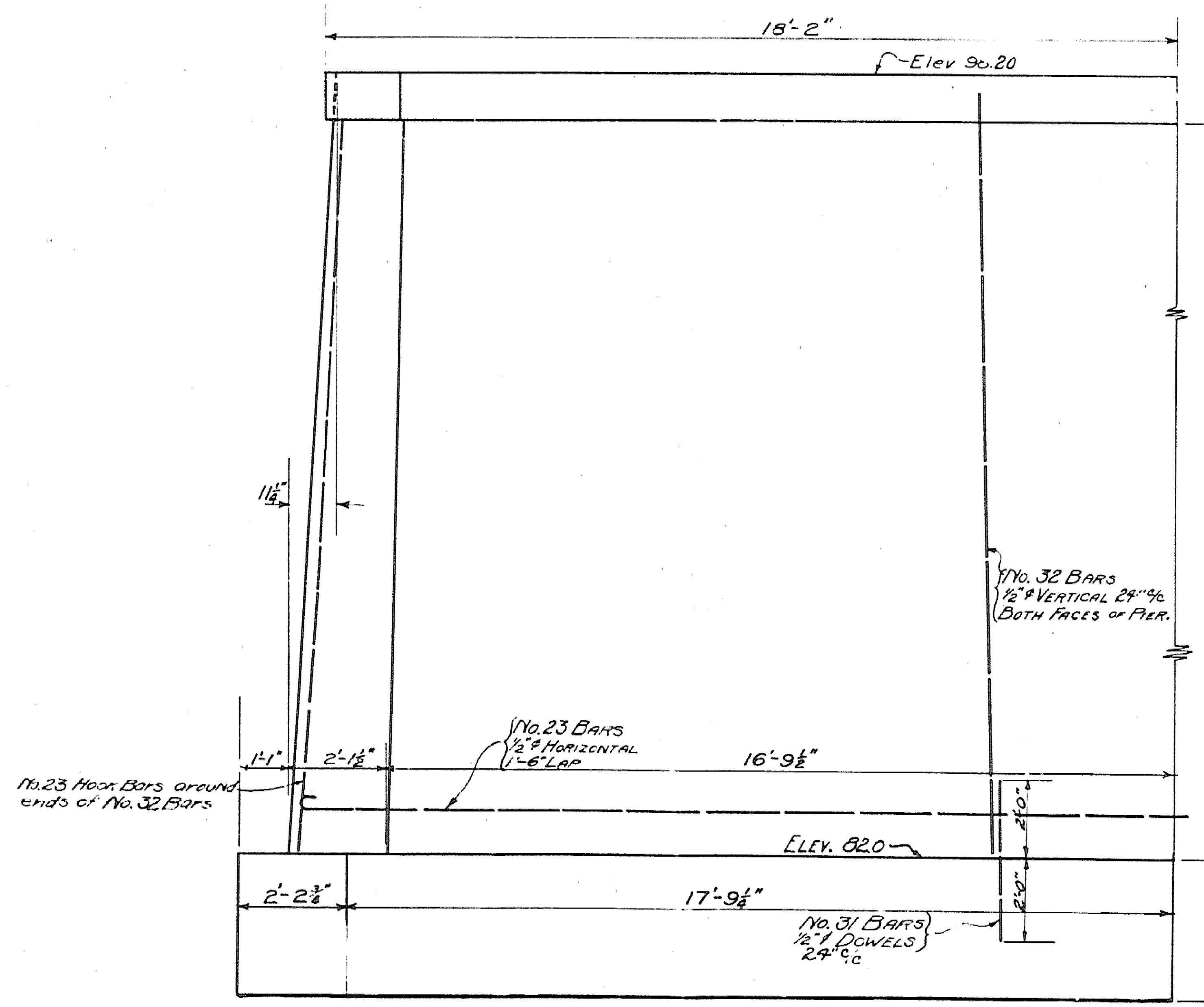
All exposed edges shall be chamfered 1"

For dowels to beams at fixed ends of bridge spans, see superstructure detail.

All piles are computed for a safe load of 15 tons each.

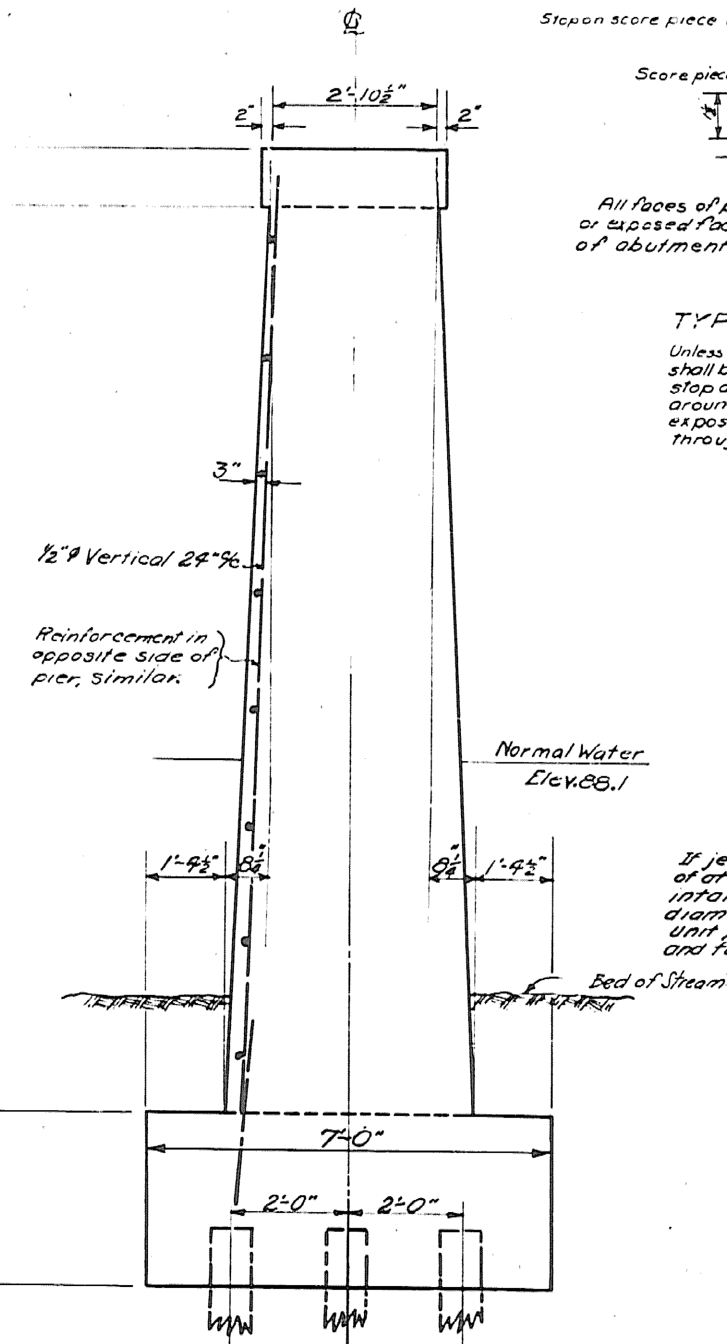
For purposes of estimate all piles have been considered as being 20' piling

The length, angle and heighth of wings may be determined or changed by the engineer.



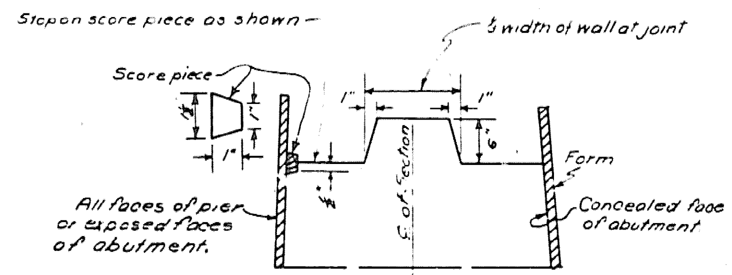
HALF ELEVATION

Scale: ½" = 1'-0"



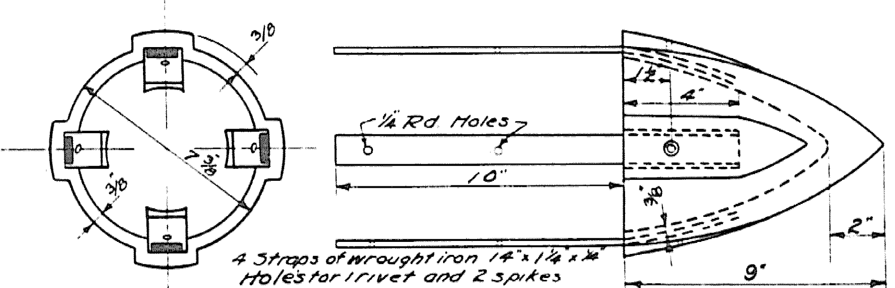
SECTION AT ℄

Scale: ½" = 1'-0"



TYPICAL CONSTRUCTION JOINT FOR WALLS

Unless otherwise directed by the Engineer, score pieces shall be equally spaced vertically at about 1'-6" c/c. shall stop at underside of copings and shall be carried around ends of walls or piers where they may be exposed to view. Score marks shall line horizontally throughout job.



CAST STEEL PILE SHOE FOR 6" TO 8" TIPS

If jetting is necessary, two water jets should be used with a water pressure of at least 150 lbs. per sq. in. Pump to be of piston type with a 6" diameter intake pipe and a 4" diameter outlet pipe. The jet pipe to about 2" in diameter, nozzle to be circular in section of ½" to ¾" in diameter. Unit price bid for wooden piles shall include jetting if necessary and furnishing and placing pile shoes

PIER DETAIL FOR FIRE STATION BRIDGE OVER BLACK RIVER LUDLOW — VT

ESTIMATED QUANTITIES

Class B Concrete	101	Cu. Yds.
Timber Piling	740	Lin. Ft.
Reinforcing Steel	1150	Lbs.
Structure Excavation	70	Cu. Yds.

Surveyed by	H. P. Rodigan	3/14/28
Designed by	W. G. Huber	3/15/28
Drawn by	C. D. Lord	3/16/28
Traced by	C. D. Lord	
Checked by	M. L. Woodruff.	
Series F	No. 1219	Filed 4-18-21
Sheet 7	of 7	Sheets

Ludlow
BRF 025-1(42)
FOR REFERENCE ONLY
SHEET 73 OF 73